The Development of Body Image in Young Children: The Role of Muscularity and Adiposity.

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Abstract

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Key words: Preadolescents, young children, gender, adiposity, muscularity, body dissatisfaction, body image, body ideals, stereotypes

Negative body image can cause serious psychological problems. In some Western societies, body image concerns can develop at a young age, with early preadolescents preferring thinner bodies and reporting body dissatisfaction. The aims here were to clarify the significant gaps in published research, and to challenge existing assumptions around weight, muscularity, and body satisfaction in children. In addition, this novel research focused on young children's body dissatisfaction, particularly young boys (aged 4-11 years).

Traditional measures of body satisfaction are limited and do not incorporate muscularity, assess individual body parts, or indicate the direction of dissatisfaction. Here, new visual measures were developed along with a prototype application for a touch-screen tablet to measure body satisfaction in children. Through 4 innovative experimental studies the current research explored factors influencing body image: including gender, age, ethnicity, BMI, perceived body size, and sociocultural factors (e.g. cultural ideals and body size stereotypes).

Results consistently supported the findings of study 1 which showed gender differences in body satisfaction: boys were more dissatisfied with their bodies than girls, and their dissatisfaction varied over the different body parts (torso, arms and legs). Stereotypical idealised body perception was evident: boys wanted to be muscular and girls desired to be lean.

In study 2, ideal body choices saw boys choosing more muscular figures and girls more lean figures for the self, than the ones they choose for another boy or girl. Boys desired more muscular ideal figures than what they perceived the opposite sex would choose. Study 3 revealed the pattern of assigning positive attributes was gendered. Boys viewed the hypermuscular figure the most positively and girls the normal weight and lean figures the most positively. However, both sexes did not want to look like the overweight figure as a child or adult. Study 4 showed parent's body satisfaction and their perception of their child's current body size predicted child's body satisfaction, and exposure to media predicted the child's ideal and future ideal adult figure choices. Overall, a combination of factors involved in the development of children's body image were revealed, including sociocultural influences, age, ethnicity, and perceived body size.

The research carried out within this thesis has extended our knowledge of pre-adolescent's body dissatisfaction, has developed innovative measures for use with younger children, and revealed fascinating findings around young boys' body image.

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Table of Contents

List of figures

List of tables

Chapter 1
General introduction:

The aim of this thesis was to investigate young children's body image. This is an important issue during childhood where preadolescent children, including those as young as 3 to 4 years old, are reported to be focused on their body size and showing a preference for particular body shapes and sizes (see Ricciardelli et al, 2006; McCabe et al, 2007; Harriger et al, 2010). Consequently, some children demonstrate body dissatisfaction and unhappiness with the size or shape of their bodies at a young age (Schur et al, 2000; Berger et al, 2005; Ricciardelli et al, 2006).

The effects of having a poor body image are far reaching. Body dissatisfaction can lead to negative outcomes and impact on wellbeing (Stice & Shaw, 2003; Willows et al, 2013) through the dysfunctional adoption of body change strategies, such as eating less and exercising excessively to lose weight (see Davison et al, 2000; Neumark-Sztainer et al, 2002b; 2002c; Berger et al, 2005; Russell-Mayhew et al, 2012). Research shows children as young as 5 years old know what constitutes dieting (Lowes & Tiggemann, 2003) and body dissatisfaction can lead to problem eating attitudes and behaviours as reported in 6 to 8 year olds (Flannery-Schroeder & Chrisler, 1996; Kelly et al, 1999). In one study, several 8 to 10 year old boys and girls were employing behaviours such as dieting and exercise to control their weight (Shapiro et al, 1997) and 18% of 8 to 12 year old boys in another, had tried to lose weight during the research (Berger et al, 2005). It is thought that using such weight control strategies increases the risk of eating pathology in some individuals (Kotler et al, 2001; Ricciardelli & McCabe, 2001). Concerns about body fat and dieting increase with age, leading some girls to hold anorectic eating attitudes before adolescence (Maloney et al, 1989). Indeed, eating disorders are a considerable public health problem and have the highest mortality rates amongst mental health disorders (Arcelus et al, 2011). Worryingly, the number of episodes of children being admitted to hospitals for the treatment of an eating disorder rose

from 2006 to 2015, with 10 to 19 year olds, being the most common age group admitted and making up more than half of the admissions (HSCIC, 2016).

Furthermore, a high drive for muscularity is related to a desire to gain weight and muscle, and to poor self-esteem and higher levels of depression (Mcreary & Sasse, 2000). Unattainable muscularity means that some adolescents and adults engage in unhealthy and dangerous practices in an attempt to gain muscle and 'bulk up', such as using steroids (Neumark-Sztainer et al, 1999; Peters & Phelps, 2001). Behaviours and cognitions to build muscle through exercise are evident in young boys and girls (Holt & Ricciardelli, 2002; McCabe & Ricciardelli, 2003). In one study 84.3% of the 8 to 10 year old boys and 57.4% of the girls said they were exercising to become more muscular (Holt & Ricciardelli, 2002).

Despite much research in the area, there remain gaps in the literature for younger children, for example, boys under the age of 8 years old are not often studied and girls are not always included in muscularity research. The aim of this thesis was to fill some of these gaps by investigating the three aspects of weight, muscularity and body dissatisfaction with young and preadolescent children aged between 4 and 11 years old, because understanding the different body ideals for boys and girls, and when they develop, could help with producing appropriate advice for parents or early prevention programs for children displaying problematic body change strategies. According to Veldhuis et al (2012), timely targeting of interventions towards specific age groups between preadolescence and adolescence is needed, if they are to be effective.

This research took a quantitative approach, as young children (under the age of 8) can struggle to verbalise their beliefs. Appropriate visual measures were developed that were sensitive to the age of the children in terms of their inability to deal with complex cognitive demands, their limited verbal abilities and attention span, and be easy to use without the need for complex instructions or demonstrations. Overall there are a lack of measures for assessing younger children's body image (Pallan et al, 2011) and so an important part of this thesis

was to develop and use measures that addressed some of the current limitations of visual scales assessing body satisfaction in children. The design of the scale used let children express their desire for adiposity and/or muscularity, and in two of the studies a novel Body Parts Satisfaction Jigsaw enabled three separate body parts (torso, arms and legs) to be assessed.

The current research also developed a prototype of an application for a touch screen mobile tablet device to measure body satisfaction. This aimed to address several existing issues with the figure scales, to provide more accurate and consistent findings with this age group and store gathered information online.

Using the visual scales developed, the work in this thesis aimed to explore the development of body image in young children aged 4 to 11 years old. Body satisfaction was assessed throughout each study and the role of different factors that could impact on body image such as age, gender, ethnicity, BMI, and perceived body size were analysed. Gender, age, and BMI have been found to be the main factors associated with body dissatisfaction in children (see Thelen et al, 1992; Flannery-Schroeder & Chrisler, 1996; Gardner et al, 1997; Ricciardelli & McCabe, 2001). To gain a deeper understanding of children's beliefs around body size, their awareness of cultural ideals were examined. Children were asked about how they thought different male and female bodies should look, and were asked their perceptions of what body ideals the opposite sex would chose. The research then moved on to attempt to understand the ideal body choices children were making, as attitudes about body sizes held by children are likely to influence their beliefs around acceptable body sizes (Tiggemann & Pennington, 1990). A storybook method was developed to explore the positive and negative attributes children assigned to bodies that varied in adiposity and muscularity. In the final study, the aim was to understand the sociocultural influences on boys' choice of ideal body by asking parents to complete a questionnaire. Socio-cultural factors such as the media or parental influence have been found to be associated with body image

(Ricciardelli & McCabe, 2001) and so questions determining the influence of the media, the family and their involvement in exercise were asked.

Chapter 2
Introduction:

2.1. What is body image?

Body image is a complex, multidimensional construct incorporating many components, such as body shape, appearance and functioning. Cash (2004: 1) defines body image as a "…*multifaceted psychological experience of embodiment… [that] encompasses one's body-related self-perceptions and self-attitudes, including thoughts, beliefs, feelings, and behaviours*".

Body image then, is a subjective experience, and is comprised in part of perceptual elements; how one sees one's body. *Body size perception* refers to the overall mental image the individual holds of what their body looks like in terms of its size, shape and form. Some individuals may experience *body-size distortion,* which is a misrepresentation of this image where they perceive their whole body, or body parts, as a different size to what they actually are (Keeton et al, 1990; Bergstrom & Neighbors, 2006).

The attitudinal elements of body image are multidimensional and refer to how an individual thinks (cognitive), feels (emotional), and acts (behavioural) about their bodies. If an individual's perceptions of all or parts of their body differ from the body they wish to have, and the discrepancy is important to them, this is referred to as *body dissatisfaction* (Keeton et al, 1990; Wertheim & Paxton, 2012). Body dissatisfaction can range from mild to severe, and in extreme cases can lead to actions to alter the body. It is greatly influenced by cultural ideals of body shape and size (Grogan, 2008; Bergstrom & Neighbors, 2006) and seems to be a normative experience for Western women over the lifespan and for some groups of men and children (Grogan, 2008).

2.2. What is an ideal body?

In Western societies, the ideals of body shape and size portray the 'ideal' man as a mesomorphic body shape; lean, with a toned muscular V-shaped body type, comprising of a small waist, broad shoulders, and defined 'six-pack'

abdominal muscles (Grogan & Richards, 2002; Labre, 2005; Thompson & Cafri, 2007; Tiggeman, 2011a). The ideal woman looks very thin (Thompson et al, 1999) and physically fit (Forbes, et al, 2004; Tiggeman, 2011a). However, although muscular toning seems important for men and women, Hobson's (2002) research with adults found that too much visible muscle on women is not desirable. Muscular female athletes perceive themselves as more masculine than non-athletes (Miller & Levy, 1996) and hyper-muscular females are seen as 'violating gender norms' (Forbes et al, 2004). As a result, female body builders try to balance building 'acceptable' muscles without attaining an overly muscular physique, in order to retain their femininity (Grogan et al, 2004). In the same way, there is an acceptable 'moderate' amount of muscle for men as well, where extreme hyper-muscularity is not seen as desirable (Grogan & Richards, 2002).

Conforming to the ideal symbolizes success, even for children, who equate being overweight with impaired social functioning and lack of success (Hill & Silver, 1995), but men and women need to exert constant control over their bodies, in terms of diet and exercise, in an attempt to achieve this (Grogan, 2008). Nonetheless, societal ideals set an unrealistic level of body fat and muscularity that is unachievable for most men and women to attain through healthy means (Pope et al, 2000; Tiggemann & Slater, 2004). Not measuring up to the ideal disseminated in the media, has arguably contributed to body dissatisfaction and unhealthy body change strategies for males and females (Levine & Smolak, 1996; Becker et al, 2002; Blond, 2008; Mulgrew et al, 2014). Even preadolescent children dissatisfied with their weight have been shown to engage in weight loss behaviours, such as dieting, in an attempt to lose weight to attain the leaner body ideal (Davison et al, 2000; McCabe et al, 2005; Ricciardelli & McCabe, 2004).

2.3. Body image development for boys and girls

From a young age children seem to have an idea about which body shapes and sizes are desirable in their society and the thin ideal is internalised early, with preschool children displaying aversion to overweight, obese and average sized

figures (Harriger et al, 2010), and girls as young as 4 or 5 preferring very thin bodies (Davison et al, 2000; Williamson & Delin, 2001; McCabe et al, 2007). Girls generally demonstrate greater body size dissatisfaction than boys (Robinson et al, 2001; Williamson & Delin, 2001; Rinderknecht & Smith, 2002; McCabe & Ricciardelli, 2004), although this could be because much research focuses on adiposity and does not include muscularity. Approximately 50% of preadolescent girls and between 30-50% of boys show dissatisfaction with their body (Thompson & Chad, 2000; Ricciardelli & McCabe, 2001; Ricciardelli et al, 2003; Clark & Tiggemann, 2006; Ricciardelli et al, 2006; Duchin et al, 2015). In contrast, some research does report similar levels of dissatisfaction for boys and girls: but the nature of the dissatisfaction differs (see Dion et al, 2016).

Although gender differences in body dissatisfaction have not always been established in younger children aged 6 to 7 years old (Thelen et al, 1992; Gardner et al, 1997), or in Australian children aged 9 to 10 years of age (Tiggemann & Pennington, 1990), there is a wealth of research suggesting there are gender differences. When assessing the self, both girls and boys choose an ideal figure that is thinner than their perceived actual body size (see Collins, 1991; Rolland et al, 1997; Markovic et al, 1998; Gardner et al, 1999a; Davison et al, 2000; Schur et al, 2000; Rinderknecht & Smith, 2002; Smolak, 2002; Truby & Paxton, 2002; Ricciardelli et al, 2006; McCabe et al, 2007). However, this figure choice is higher for girls than boys, with around 28%-55% of girls and 17%-30% of boys wanting to be thinner (see Ricciardelli & McCabe's, 2001 review). For girls, their main concern seems to be with weight loss and desiring a thinner figure (Collins, 1991; Schur et al, 2000; Truby & Paxton, 2002; Dion, 2016), and when girls are asked about their bodies, they fear becoming overweight and say they want to be thin, as a child and when they are an adult (Grogan & Wainwright, 1996).

In contrast, preadolescent boys' body concerns are divided between wanting to be thinner, or desiring a larger figure, or muscular physique (Schur et al, 2000; Smolak, 2002; Ricciardelli et al, 2006; McCabe et al, 2007; Grogan, 2008; Dion, 2016). Boys as young as 4 years old have commented on wanting to increase

their muscularity, according to their mothers (McCabe et al, 2007). Some girls also want to be larger, but not as many as boys, with figures showing around 0%-36% of girls and 13%-48% of boys desiring a larger body shape (Thompson & Chad, 2000; Ricciardelli & McCabe, 2001; Ricciardelli et al, 2003; Clark & Tiggemann, 2006; Ricciardelli et al, 2006; Duchin et al, 2015). As girls and women are not as often included in body image research involving muscularity (McCreary, 2011), it is not clear whether girls share the same concerns around muscularity as boys. Nevertheless, some girls do express a desire for a muscular physique (Ricciardelli et al, 2003; McCabe et al, 2006), whilst others regard muscles as inappropriate for females (Grogan & Wainwright, 1996). It seems girls and boys are aware, from a young age, of the pressure to conform to two distinct body shapes: thin for girls and mesomorphic (high muscle mass, little adipose tissue, with shoulders wider than the hips) for boys (Barlett et al, 2008).

2.3.1. Age

There is no clear consensus on the age at which body dissatisfaction develops, but girls do seem to be investing in the thin ideal at a young age (Ricciardelli & McCabe, 2001; Harriger et al, 2010). Research into stereotypes indicates that girls and boys have an awareness of the thin ideal from the age of 3 years old, demonstrating a preference for thin and average sized figures (Frankova, 2000; Lowes & Tiggemann, 2003), and aversion to overweight and obese ones (Brylinsky & Moore, 1994; Cramer & Steinwert, 1998). However, 'awareness' of body ideals is different to, and develops before, 'internalisation', where ideals are absorbed, thus this research does not adequately show whether these ideals have been internalised as a personal preference at this age (Thompson & Stice, 2001; Harriger et al, 2010). With this in mind, Harriger et al (2010) used an emotional investment task which required girls to choose and then switch different game pieces demonstrating different body sizes, and suggested that some girls as young as 3 years old were emotionally invested in the thin ideal.

Much research reports that girls develop dissatisfaction with their bodies at around 7 years old (Tiggemann & Pennington, 1990; Collins, 1991; Wood et al,

1996; Tiggemann & Wilson-Barrett, 1998; Schur et al, 2000), and for some as early as 5 or 6 years old (Flannery-Schroeder & Chrisler, 1996; Davison et al, 2000; Lowes & Tiggemann, 2003). It is likely that the psychological processes that lead to body dissatisfaction are embedded by the age of 9 (Sands & Wardle, 2003; Clark & Tiggemann, 2006). For boys, the picture is less clear. Some studies employing the figure scale measure found boys were dissatisfied with their bodies at around 6 years old (Flannery-Schroeder & Chrisler, 1996; McCabe & Ricciardelli, 2004) or around 8 years old (Robinson et al, 2001), but in contrast others report that there is no discrepancy between the current and ideal figures picked, suggesting boys are not dissatisfied with their bodies at all (see Gardner et al, 1997; Williamson & Delin, 2001; Lowes & Tiggemann, 2003). However, this could be a consequence of the method used. When there are equal numbers of boys who choose thinner and heavier figures, these preferences cancel each other out, thus making it appear that boys are not demonstrating body dissatisfaction, when they actually are (Jacobi & Cash, 1994; Schur et al, 2000; McCabe & Ricciardelli, 2004). This emphasizes the need to report the direction of body (dis)satisfaction (Dion et al, 2016). Using different methods, such as interviews, parents were asked about their child's body satisfaction and this research suggested that boys as young as 4 years old were demonstrating some dissatisfaction with their bodies (McCabe et al, 2007).

Body dissatisfaction seems to increase with age for girls, peaking at adolescence (Thelen et al, 1992; Gardner et al, 1997; Schur et al, 2000; Ricciardelli & McCabe, 2001; Kostanski et al, 2004; Clay et al, 2005; Li et al, 2005; Eisenberg et al, 2006). For example, a study by Veldhuis et al (2012) showed that girls aged 12 to 13 years old and 15 to 16 years old had similar levels of body dissatisfaction, but significantly higher body dissatisfaction than the 9 to 10 year old girls. In support of this, it was the 13 to 14 year old girls, rather than the 10 to 11, or 17 to 18 age groups, who most often reported the negative effects they felt poor body image had on them (Polce-Lynch et al, 1998). There is a mixed picture for boys; some findings suggest body

dissatisfaction increases with age for boys (Folk et al, 1993; Rolland et al, 1997; Kostanski et al, 2004; Li et al, 2005; Eisenberg et al, 2006) and others found little difference across age groups (Thelen et al, 1992; Lawrence & Thelen, 1995; Ricciardelli et al, 2006). Poor body image may affect older boys' wellbeing more than it does for younger boys, for instance, when 10 to 11 year old boys were asked about the effect body image had on them, more boys reported a positive effect at this age as opposed to the 17 to 18 year olds, where more reported a negative effect (Polce-Lynch et al, 1998). For boys, the nature of the body image concerns may change with age. In Parkinson et al's (1998) research, the younger boys desired a larger body shape, whilst the older boys wanted a leaner one.

Although the precise age of the development of body dissatisfaction is uncertain, it is clear that body dissatisfaction develops before adolescence for some boys and girls (see Davison et al, 2000; Robinson et al, 2001; McCabe et al, 2007). Thus, the time between preadolescence and adolescence seems to represent a critical time for children where negative body perceptions steadily increase (Veldhuis et al, 2012).

2.3.2. Ethnicity

As ideals of body size and body satisfaction are influenced by culture (Smolak, 2011; Tiggemann, 2012), it is important to explore the effect of ethnicity on the development of body dissatisfaction in children. However, there are many mediating variables that can account for differences found, such as media or family influences, and so the relationship between ethnicity and body dissatisfaction is complex (Pallan et al, 2011), and the impact of findings for diverse groups of children are unclear (Smolak, 2004). Body image research on Ethnic minority groups of children living in Western areas still presents an understudied area (Veldhuis et al, 2017) and the lack of consistency with method and samples is reflected in the varied results reported (Edwards George & Franko, 2010).

Meanings attached to different body sizes vary within and between cultures. In contrast to the Western thin ideal, larger body sizes are perceived positively in some cultures, for example, the traditional Hispanic and Hmong ideals of a larger body size shows the individual is well looked after and has health, wealth and beauty (Franzen & Smith, 2009; Olvera et al, 2011). However, some research shows children culturalised into the West, assimilate the Western ideals for males and females in contrast to the culturally traditional heavier ideals their parents approve of (Mulasi-Pokhriyal & Smith, 2010). As a consequence, those who identify strongly with the new culture, by assuming its behaviours and perceptions, for example, also report high levels of body dissatisfaction and some are adopting weight loss strategies to achieve the Western body ideal (Ayala et al, 2007; Mulasi-Pokhriyal & Smith, 2010). In a study by Veldhuis et al (2017) of non-Western ethnic minority children (Moroccan, Turkish, Surinamese and Antillean) aged 8 to 12 years old living in the Netherlands, the majority of boys and girls preferred an ideal figure thinner than their own and it was the Moroccan and Turkish girls who showed the most body dissatisfaction. The cultural body ideals of some non-Western cultures, such as Surinamese and Antillean, is for a curvaceous body (Nicolaou et al, 2012), which contrasts with the child's preference for a Western thinner ideal (Veldhuis et al, 2017). The endorsement of the traditional ideal, combined with the symbolism of food linked to hospitality in some cultures (Delavari et al, 2013), can create a tension between parent and child (Veldhuis et al, 2017). For instance, the child may feel pressured into not refusing food, but the abundance can lead them to overeat and become overweight or obese (Nicolaou et al, 2009; Delavari et al, 2013), thus moving their body away from the Western thin ideal.

In addition, the Western ideals of thinness are penetrating other cultures. In a study of Turkish adolescents living in Turkey, the number of boys and girls endorsing the thin ideal and reporting dieting behaviours was alike to those from Western countries (Canpolat et al, 2005). Supporting this, Li et al (2005) found similar levels of body dissatisfaction in Chinese boys and girls living in China as found in Western countries, although more Chinese girls desired a larger body

shape than found with Western girls. Ricciardelli et al (2007) suggest that research with non-Western populations needs to assess the extent to which satellite TV is bringing Westernized ideals to these cultures. The International Body Project (Swami et al, 2010) surveyed 26 countries in 10 major world regions and found that the males and females who showed greater preference for a thinner female figure had higher exposure to Westernized media. This is likely the case for children and adolescents also.

There is some inconsistency in the literature around ethnicity and body image. Wildes and Emery's (2001) meta-analysis showed that Whites report more body dissatisfaction and eating disturbance than other groups. However, some research comparing White with non-White ethnic minority groups suggests no ethnic differences observed in body image (see Ricciardelli et al, 2007). In a study by Olvera et al (2014) of White American and Hispanic preadolescents aged 10 to 13 years old, there were no significant ethnic differences between the ideal figure chosen or body dissatisfaction between the ethnic groups. This is also supported by a meta-analysis of research with American women from White and ethnic minority groups (Grabe & Hyde, 2006), and challenges the notion that only White women experience body dissatisfaction or eating disorders (Mastria, 2002).

There is a focus in Asian cultures on females being a certain body size that fits the 'norm' and being beautiful enough to attract a partner, and so could leave Asian females vulnerable to body dissatisfaction (Kawamura, 2012). Xanthopoulos et al (2011) for example, showed Asian children had the greatest body dissatisfaction, more so than the African American, Caucasian and Hispanic children living in the same urban region. It seems that Asian children living in the West are aware from a young age of the Western ideals for body size (Pallan et al, 2011) which contrasts to the traditional larger body sizes some of their cultures endorse. For example, Hill and Bhatti (1995) found British Asian girls and Caucasian girls similarly desired a thinner figure as an ideal and this is supported by research by Pallan et al (2011). Pallan et al (2011) studied a UK sample of South Asian (Pakistani, Bangladeshi, and Indian) 5 to 7 year

olds and found that the overweight and obese children from all ethnic groups demonstrated higher body dissatisfaction and a desire to be thinner than other weight categories. This is interesting as a larger body size is traditionally desired by these cultures, but was rejected by these girls. However, there are mixed findings regarding male Asian populations, with groups showing greater body image concerns or lesser concerns in comparison to Whites, probably due to the research not differentiating between BMI or different cultural groups within the Asian population (Ricciardelli et al, 2007).

There are fairly consistent findings with African American male and females, who from preadolescence to adulthood demonstrate less dissatisfaction with their body shape and size and body parts than other groups (see meta-analyses by Wildes & Emery, 2001 and Grabe & Hyde, 2006; and review by Ricciardelli et al, 2007; Xanthopoulos et al, 2011). This is still the case when they are overweight (Neumark-Sztainer et al, 2002a; Padgett & Biro, 2003) or heavier than the other groups studied (Schreiber et al, 1996). It is thought this is partly due to families transmitting positive messages around larger body sizes and a general acceptance of a larger range of body types in these cultures (Ricciardelli et al, 2007; Murnen & Don, 2012). In support of this African American boys and girls choose larger figures than Caucasian children as an ideal body for the self, or ideals for males and females (Lawrence & Thelen, 1995; Thompson et al, 1997; Ricciardelli et al, 2007). In contrast, overweight Black girls seeking weight-loss intervention, have shown similar levels of body dissatisfaction to overweight White girls (Kelly et al, 2011). The Black girls still preferred larger body sizes than the White girls in the study, but thinner than usually reported. The authors noted that the Black girls may support the desire for a thinner figure due to being part of a weight-loss intervention and this is not typical of other groups of Black girls (Kelly et al, 2011).

2.3.3. BMI

Body Mass Index (BMI) should be included in studies of body dissatisfaction as lower and higher BMI seem to have different implications for body image (Jones & Crawford, 2005; Brann, 2010). Most research indicates that children who have a higher weight status, and are overweight or obese, express the greatest

dissatisfaction with their bodies (Rinderknecht & Smith, 2002; McCabe et al, 2005; McCabe et al, 2006; Clark & Tiggemann, 2006; Goldfield et al, 2010; Olive et al, 2012; Willows et al, 2013; Olvera et al, 2014; Dion, 2016) and a higher proportion desire to be thinner than normal weight or underweight children (for example, see Tiggemann & Pennington, 1990; Rolland et al, 1996; Rolland et al, 1997; Pallan et al, 2011; Xanthopoulos et al, 2011) and so body composition is strongly associated with body dissatisfaction. This has been replicated in studies from various parts of the world and with children from different ethnic groups (for example see Ricciardelli & McCabe, 2001; Mirza et al, 2005; Clark & Tiggemann, 2006; Freeman et al, 2011; Pallan et al, 2011; Xanthopoulos et al, 2011). It is likely children with a higher BMI feel dissatisfaction because they have internalized the bias Western society holds towards obese people (Smolak, 2002).

Preadolescence represents a time of extensive bodily changes and weight gain for some during puberty and so is also a risk factor for body dissatisfaction (McCabe & Ricciardelli, 2004). Interestingly, overweight girls demonstrate more body dissatisfaction and are more likely to desire a thinner shape than boys of the same weight (Willows et al, 2013) and this could be due to the girls' awareness that female bodies are objectified and judged on appearance more than males are (Levine & Smolak, 2002). Moreover, puberty for girls may move their bodies further from the thin ideal, whilst boys develop in the direction of the bulkier male ideal (Rosenblum & Lewis, 1999; Tiggemann, 2004) and so this may account for the differences in satisfaction.

In addition, normal weight and underweight children also show dissatisfaction with their bodies (for example, see Dion et al, 2016). Generally, underweight children have not been studied as often as other BMI groups, usually due to low participant numbers (McCabe et al, 2005) and so findings for these children are mixed. The relationship between BMI and body satisfaction may be moderated by gender (Rolland, 1996; Kostanski et al, 2004). The pattern of body dissatisfaction for boys and girls differs with BMI, where there is a linear increase in poor body satisfaction with increasing BMI for girls, but a U-shape

for boys, as both those of low and high BMI show dissatisfaction (Kostanski et al, 2004; Austin et al, 2009). There are also gender differences in body dissatisfaction for boys and girls with similar BMI's (Holland et al, 1996; Austin et al, 2009), where underweight boys want to be larger (Rolland et al, 1996; Dion et al, 2016), and underweight girls desire to be thinner (Hill et al, 1994; Rolland et al, 1997; Dion et al, 2016). However, in contrast, Ricciardelli and McCabe (2001) found 9 to 10 year old girls in low BMI groups, wanted to gain weight, as supported by Rolland et al (1996), who found 40% of underweight girls wanted to be larger.

The relationship between muscularity, weight and BMI for preadolescent children remains unclear and findings are varied. Research does suggest that BMI may not be a factor in the desire for muscularity in boys (Holt & Ricciardelli, 2002; McCreary et al, 2006; Ricciardelli et al, 2006). For example, in one study of 8 to 10 year old boys, a similar number in both the average BMI group (BMI between the 33rd and 68th percentile) and high BMI group (85th percentile and above) wanted a higher muscularity (Brann, 2010). Age may also be a factor rather than BMI: Boys aged 10 to 11 years in the low BMI group wanted increased muscularity, whist the younger boys with low BMI did not (McCabe & Ricciardelli, 2003). However, in McCabe et al's (2005) study, BMI was associated with muscle preoccupation, as the younger boys with lower BMI were the most focused on increasing their muscularity. It is unclear how BMI relates to muscularity in children, and so further research is needed to explore the relationship.

2.3.4. Perceived body size

A child's body size perception incorporates objective physical reality and socially influenced perceptions, such as peer criticism about body weight (Nelson et al, 2011). Body shape perception may not be accurate and can lead to an underestimation or overestimation of body size and weight (see Brault et al, 2015; Cattelino et al, 2015). Some studies show that it is the child's subjective perception of their bodies, and not their weight or BMI that has a stronger impact on their levels of body dissatisfaction (Canpolat et al, 2005;

Dion et al, 2016). For example, in Dion et al's (2016) study, preadolescents who perceived themselves as larger were more likely to desire a thinner body, and those who saw themselves as thinner were more likely to want a body that was larger. Dion et al (2016) also found gender differences where more girls than boys desired a thinner body shape when they perceived their bodies as being larger. Thus, it seems to be the discrepancy between the perceived and desired body size that gives body dissatisfaction (Ogden & Evans, 1996; Gruber et al, 2001; Canpolat et al, 2005).

Moreover, overweight children seem to be the most inaccurate in their estimation of their body size and weight (see Maximova et al, 2008; Wang et al, 2009; Veldhuis et al, 2017) and were more likely than normal weight or underweight children to identify themselves as thin in Cramer & Steinwert's study (1998) of 3 to 5 year olds. The authors suggest that the inaccuracy in body size estimation could be due to a deliberate effort by the child to misidentify their bodies as thinner following feelings of greater body size stigmatization, rather than a cognitive inability to judge body size (Cramer & Steinwert, 1998). Thus, they choose the thinner current body size as a way to distance themselves from their size, and maintain and protect their self-esteem. Furthermore, the findings that overweight children seem to be particularly vulnerable to weight related criticism about their bodies, would support this idea (Nelson et al, 2011).

2.4. Stereotypes and stigma: 'Fat is bad'

With preferences for thinner and/or muscular ideals, unsurprisingly our society holds negative attitudes towards overweight and obese individuals (Rothblum, 1992; Neumark-Sztainer et al, 1998). These attitudes are transmitted to children with evidence of the development of them during the preschool years (Musher-Eisenman et al, 2003; Spiel et al, 2012). The negative attitudes held by children are likely to influence their beliefs around acceptable body sizes (Tiggemann & Pennington, 1990) and can affect their self-perceptions as well (Cramer & Steinwert, 1998; Neumark-Stzainer et al, 1998; Musher-Eizenman et al, 2004). Very young children from the age of 3 years old have some awareness of the

anti-fat stereotype, and this bias seems to increase with age (Brylinsky & Moore, 1994; Cramer & Steinwert, 1998; Musher-Eisenman et al, 2003; Spiel et al, 2012). Many young girls know it is not acceptable or desirable to be overweight or obese (Cramer & Steinwert, 1998; Musher-Eisenman et al, 2003) and girls as young as 8 years old fear having a higher adiposity (Shapiro et al, 1997).

Children and adolescents who are overweight become targets of social stigma, weight bias and stereotyping from numerous sources, such as from their peers (Brylinsky & Moore, 1994; Hill & Silver, 1995; Wardle et al, 1995; Cramer & Steinwert, 1998; Tiggemann & Wilson-Barrett, 1998; Neumark-Sztainer et al, 2002b; Latner et al, 2005), or own parents (Crandall,1995; Davison & Birch, 2004; Puhl & Brownell, 2006). Overweight individuals also share these anti-fat attitudes (Lerner & Korn, 1972; Crandall, 1994; Latner et al, 2005; Schwartz et al, 2006) thus suggesting they have internalized the societal stigma and negative stereotypes around larger body sizes (Puhl & Latner, 2007).

Consistent with Social Learning Theory (Bandura, 1977), body size stereotypes develop due to a cultural expectation that pre-judges the behaviours of overweight and obese individuals based on their body size, for example, being mean, lazy, unfriendly, naughty, and so on (Brylinsky & Moore, 1994; Cramer & Steinwert, 1998; Musher-Eizenman et al, 2004; Spiel et al, 2012). Childhood and adolescence represents a particularly vulnerable time where individuals are sensitive to the negative social and emotional effects of body size stigma, because their self concept and identity are developing and they are forming relationships with their peers (Erikson, 1993; Puhl & Latner, 2007). Expectations of behaviour, due to body size stereotyping, can result in the differential treatment of the individual by others. For example, overweight children may be subject to negative appearance related comments and teasing (Neumark-Sztainer et al, 2002b; Young-Hyman et al, 2003) or face peer rejection (Strauss et al, 1985). This in turn, can alter their behaviour, for example by adopting bullying behaviour (Janssen et al, 2004) and children begin to perceive themselves in the same negative way as society does (Cramer & Steinwert,

1998). As children get older and become aware of their body size this could lead to poor body perception, negative self-judgments and feelings of body shame, depression and social isolation (Cramer & Steinwert, 1998; Sjöberg et al, 2005).

2.5. The sociocultural model of body image development

In this thesis, the author acknowledges there are different psychological models of body image, but has focused on the sociocultural perspective as it is a dominant framework for understanding body image (Tiggemann, 2012) and the most relevant to the research conducted here.

Cultural expectations of body shape and size may contribute to body dissatisfaction. The sociocultural theory helps explain how the wider sociocultural environment, that is the practices, beliefs and norms of a society transmit messages about standards and ideals around beauty and appearance (Tiggemann, 2011a; 2012). The society prescribes the physical characteristics that are socially valued for males and females, and what it means to posses or lack these (Tiggemann, 2012). These messages are internalized by the individual and although the model acknowledges individual differences in response, these messages may contribute to body dissatisfaction, and resulting behavioural consequences, if an individual feels they do not fit the ideal (Tiggemann, 2011b; 2012). Body ideals are communicated subtly and/or explicitly through three primary sources: the mass media, family, and peers, conveying values and attitudes around physique, appearance and weight (Ricciardelli & McCabe, 2004; Halliwell & Harvey, 2006). Exactly how the messages are transmitted to children is unclear, and it is likely that a combination of factors and individual differences influence the development of a child's body image dissatisfaction (Tiggemann, 2012). This model is well supported with a body of evidence, as discussed in this section. However, sociocultural influences are not well researched with preadolescent children (Ricciardelli et al, 2000; Tiggemann, 2012) and where they are studied, results are contradictory, with some indicating that boys' body image is not affected by sociocultural influences at all (Ricciardelli et al, 2000).

Social Comparison Theory (Festinger, 1954) can help explain how sociocultural factors influence body image. This theory posits that an individuals' drive to gain an accurate self-evaluation can be accomplished by making a comparison across different domains (for instance, attractiveness, success) with similar others (Festinger, 1954). The media, family members and peers set standards of appearance for social comparisons and so if there is a perceived discrepancy between the images and oneself, social comparison can increase body dissatisfaction, as seen with adolescent boys and girls (Botta, 2003; Hargreaves & Tiggemann, 2004). For example, adolescent boys who viewed muscular singers in music videos, reported higher levels of social comparison and higher body dissatisfaction than those who watched non-muscular singers (Mulgrew et al, 2014). Social comparisons are also made for self- improvements and self-enhancement (Halliwell, 2012) and so a perceived discrepancy can lead the individual to engage in behaviours, such as weight-control, to meet the ideal (Labre, 2002).

2.6. Sociocultural influences and body image in children

Preadolescent children are exposed to pervasive, gendered, messages about body shape ideals through a variety of sources (Smolak, 2011). Those from parents and the media, including toys marketed at children, will be discussed here.

2.6.1. Parental influences

Modelling theory (a Social Learning Theory, Bandura, 1977) posits family members such as parents, siblings, uncles and aunts, model body image for children through their attitudes and behaviours. Comments about their own or others' bodies and their behaviour towards their own bodies, such as covering up disliked body parts, set a family standard for what is an acceptable body image (Rogers, 2012). Children internalize these messages and construct their own body image around them. Research has highlighted the impact of parental attitudes on this development, for example, children whose mothers' have high internalization of the thinness ideal are more likely to pick a thinner figure to represent a person with positive characteristics (Spiel et al, 2012). Moreover,

there is a significant correlation between the parent and child for measures of body dissatisfaction, where higher body dissatisfaction in the parent was reflected in the ratings of their 9 to 13 year old children (Brown & Ogden, 2004) and children whose parents had high body dissatisfaction, showed greater negative body size stigmatization (Rich et al, 2008).

According to the modelling theory then, parents' attitudes towards weight could influence their child's attitudes towards weight (Bandura, 1977). Parents model both weight and dieting behaviours and reinforce this through their comments (Ricciardelli & McCabe, 2001; Smolak & Levine, 2001). Some published research shows a relation between mother's own weight concerns, and their child's level of weight concern (Steiger et al, 1994) and body dissatisfaction (Keery et al, 2006; Smolak et al, 1999). Boys who perceived their mother as frequently trying to lose weight, were more likely to become concerned with their own weight, and girls were more likely to become constant dieters (Field et al, 2001). The role of fathers is unclear in this study, but both boys and girls were more likely to become constant dieters if they perceived their thinness, or lack of fatness, was important to their father.

Some published research reveals factors such as gender and age may mediate the impact of parental attitudes. For example, Anschutz et al (2009b) found that the child's perception of maternal weight concern was not related to the child's body dissatisfaction in younger children (aged 7 to 8 years old), but it was in the older children (aged 9 to 10 years old), perhaps indicating that the older children had a greater awareness of the parental behaviours and attitudes being modelled. However, there were no differences found in the effect of parental attitudes between boys and girls (Anschutz et al, 2009b). In another study, father's attitudes around weight predicted boys' weight bias and an increase in awareness of strategies for weight loss, but for girls, their mother's attitudes did not shape their beliefs in this way (Spiel et al, 2016). In other published research, links between mothers' and daughters' degree of dietary restraint was found (Hill et al, 1990). Children who perceived their mother as encouraging them to be thin, demonstrated higher body dissatisfaction and/or more

restrained eating behaviours, such as deliberately eating slimming food (Thelen & Cormier, 1995; Smolak et al, 1999; Anschutz et al, 2009b). It should be noted that overall there is a lack of research around sons' and fathers' body image. *Active influence theory* differs from modelling theory in that the attitudes and behaviours of family members are perceived as being directed towards another individual (Rogers, 2012). Children may receive messages and feedback about their physical appearance from family members, which can be perceived as positive or negative, regardless of intention, and can affect body image. There are gender differences in the importance of these influences. In a study looking at parental evaluation of their 9 to 11 year old children's physical appearance, children were found to be accurate in predicting their parent's appraisal of body size (Pierce & Wardle, 1993). Girls with parents who appraised them as fatter, and boys whose parents appraised them as thinner, had lower self-esteem, perhaps reflecting awareness of the socially acceptable body size for each sex.

Unsurprisingly, negative attitudes and behaviours from parents in the form of criticism and teasing about body shape and size can impact on a child's body image. In a review of current literature on teasing, the authors reported a well established positive association between teasing, body dissatisfaction and disordered eating (Menzel et al, 2010). For 11 to 15 year old girls, teasing by their fathers in particular, was associated with body dissatisfaction, internalization of the thinness ideal, eating disturbance and poor psychological functioning, and maternal teasing was a significant predictor of depression in the girls (Keery et al, 2005).

Moreover, research with 11 to 16 year old boys, found a combination of parental teasing, peers, and media were factors that contributed to their use of muscle-building techniques such as using food supplements and steroids during early adolescence (Smolak et al, 1999) and peer and parent pressure predicted food supplement use in another study (Ricciardelli & McCabe, 2003). In contrast, Irving et al (2002) found it was family pressures around weight, and not peer teasing and dieting, that influenced steroid use among adolescent boys. However, even positive, encouraging messages from parents about controlling

weight and shape are found to be a strong predictor of weight or muscle concerns in 11 to 16 year old boys and girls (Helfert & Warschburger, 2011). In contrast, parental nurturance, that is, the positive support, encouragement and guidance given by the parent towards their child, has been shown to 'protect' body image. For example, for boys, aged 10 to 11 years old, the father's, but not mother's, nurturance, buffered the development of a difference between perceived current and ideal body sizes and so it was negatively associated with body image discrepancy (Shannon et al, 2014). For girls, however, there was no effect of nurturance from either parent on body image discrepancy (Shannon et al, 2014). In another study, it was the mothers who exerted the greatest influence on boys' body image and these messages around body shape and size were largely positive, contributing to body satisfaction (Ricciardelli et al, 2000). Although in the same study, boys who received more messages from their mothers around eating less food, ate less to lose weight, and boys who received messages from their fathers to exercise more, engaged more in exercise to alter body shape and build muscularity (Ricciardelli et al, 2000). The variations in these findings indicate that the impact of body related messages from parents on children's body image remains unclear.

2.6.2. Media influences

Children are heavy consumers of the media. It is estimated that the average child spends 35-55 hours interacting with the media each week, including TV, the internet, advertisements, magazines and so on, and this media has become a daily part of children's lives (Harriger, 2012). Modelling theory can be applied to the media to explain its' effects. The media imposes norms of appearance for children (Lawrie et al, 2007). It transmits powerful messages around beauty ideals, and the importance of being attractive, by for example, using muscular men in advertisements for aftershave or promoting dieting products. Body dissatisfaction is mediated by two processes: by the internalization of the sociocultural messages at a young age, and/or, through the process of making social comparisons against the images presented (Barlett et al, 2008). Labre (2002) suggests the modelling of appearance ideals, combined with information on how to achieve the ideal (through facts and advertisements about dieting or

supplements, for instance), contributes to harmful behavioural outcomes, such as eating disorders.

Furthermore, the media is also critical of fatness, and very young children receive messages around the negative aspects of this, before they internalise the positive aspects of the thin ideal (Levine, 2012). The media is thought to be one of the most powerful influences impacting on body image (Tiggemann & Slater 2004). Indeed, it was this and not family influences, that predicted internalization of the thin ideal in 10 to 13 year old girls (Blowers et al, 2003). Media marketed specifically at children, such as children's television programmes, computer games, and toys, reflect the sociocultural ideals transmitted to adults (Tiggemann, 2012). In support of this, a content analysis of video media aimed at children revealed that 60% of children's videos depicted thin female characters and 32% portrayed muscular male characters (Herbozo et al, 2004). This published research also found that many children's videos contained messages portraying body stereotypes and highlighted the importance of physical appearance.

Meta-analyses indicate that both males and females experience negative body image after being exposed to images of their respective ideal bodies in the media (Murnen et al, 2007; Barlett et al, 2008; Grabe et al, 2008). For adolescent and adult females, two meta-analyses show significant positive correlations between TV exposure, magazine exposure and the triad of body dissatisfaction, internalization of the thin-ideal, and disordered eating (Murnen et al, 2007; Grabe et al, 2008). Few longitudinal studies have been conducted with preadolescent girls, but Dohnt and Tiggemann (2006) found that appearance focused TV, and not magazine exposure, predicted a decrease in appearance satisfaction one year later, in a sample of 5 to 8 year old Australian girls. Furthermore, Harrison and Hefner (2006) reported that greater TV exposure predicted a higher level of disordered eating one year later, and desire for a thinner ideal adult body shape, for 7 to 12 year old European American and African American girls. The effects can be long-lasting; adolescent girls whose body image was the most negatively affected by viewing

TV advertisements endorsing the thin ideal, had higher levels of body dissatisfaction and drive for thinness two years later (Hargreaves & Tiggemann, 2002; 2003; 2004).

Moreover, some research indicates the effects of the media on body image differ with age for girls, with the effects increasing after the age of 6 years old and as girls get closer to puberty. For example, with 3 to 6 year old girls, there was no effect on their body image of exposure to appearance focused TV (Hayes & Tantleff-Dunn, 2010), but with girls aged 7 to 9 years old, watching music TV and soaps, led to thin ideal internalization and was indirectly related to body dissatisfaction (Anschutz et al, 2009a). In addition, only the older girls aged 11 to 12 years old, and not younger (9 to 10 and 10 to 11 year olds), showed greater body dissatisfaction after watching an (adult) thin ideal television clip (Anschutz et al, 2009a).

For males, the results from Barlett et al's (2008) two meta-analyses of correlational and experimental studies, suggest that exposure to muscular images in the mass media can lead to a negative self-image, such as poor body satisfaction and can increase the probability of behavioural outcomes like excessive exercising. Barlett et al (2008) found that there was a greater media influence on body image for young adults, than adolescents. In support of this, a meta-analysis of recent research showed there was a small, but significant effect on the body dissatisfaction of young men who were exposed to images of the muscular male ideal (Blond, 2008). However, for preadolescents and adolescents, there are inconsistent findings reported (Diedrichs, 2012). Some studies found Australian adolescent boys perceived either a positive effect, or no effect, of the media on their body image (Ricciardelli et al, 2000) and media was negatively correlated with strategies to increase muscles in 8 to 11 year old boys (McCabe & Ricciardelli, 2003).

In contrast, Ricciardelli et al (2006) found that preadolescent boys who perceived pressure to alter weight and muscularity, felt increased body dissatisfaction one year later and were engaging in strategies to increase

muscle mass. However, exposure to body ideals on TV did not predict disordered eating after one year for Black and White preadolescent boys (Moriarty & Harrison, 2008), although they did in an earlier study by Harrison (2000). One possible explanation of the conflicting findings with boys could be that at this young age, they are influenced more by their peers and family, than by the muscular images in the media (Diedrichs, 2012).

Research seems to indicate that various types of media impact on body image differently for boys and girls. For example, viewing idealized images of men and women in TV adverts led to increased body dissatisfaction in adolescent girls, but not boys (Hargreaves & Tiggemann, 2004; Humphreys & Paxton, 2004). In contrast, when watching music videos, adolescent boys viewing muscular singers, reported a greater negative effect on body image and mood, than those viewing singers of an average appearance (Mulgrew et al, 2014). Findings are similar with print media: 6 to 11 year old boys who viewed objectified images of men (muscular models from fashion, sports and fitness magazines) were aware of, and had internalized, the muscular ideal, but it did not correlate with body esteem (Murnen et al, 2003). In this research, there was a stronger and more consistent relationship between response to the ideal images and body dissatisfaction for girls, than boys.

In relation to wanting to be thinner, the 9 to 14 year old boys and girls who showed high weight concerns, as well as becoming constant dieters, were those who made an effort to look like same sex role models in the media (Field et al, 2001). Some research suggests that girls are more susceptible to perceived media messages around losing weight, and boys to perceived messages from close relatives and peers (McCabe & Ricciardelli, 2005b). Boys perceived greater pressure from parents and peers to develop their muscularity (Meesters et al, 2007), whereas girls had internalised thin-ideal media messages, and this predicted body dissatisfaction (Cusamano & Thompson, 2000). Furthermore, compulsive exercise in boys was predicted by perceived messages from family and peers to become more muscular (Goodwin et al, 2011; 2014) and compulsive exercise in girls was predicted by feeling pressure

from the media to be thin (Goodwin et al, 2014). It seems girls and boys were engaging in exercise as a way to manage weight, or gain muscle, in response to the cultural ideals around body shape and size.

It is unlikely that media alone affects body image and it may be the combination of sociocultural factors that has an effect. Ricciardelli et al (2000) found that friends, siblings, parents *and* the media all had an influence on body image for more than a third of the adolescent boys in their study. The boys felt the media encouraged exercise to change body shape, but that fathers and male friends reinforced this message. Moreover, the media, peers, and parents, who had teased or commented on muscle size, influenced the use of muscle building techniques in adolescent boys and social comparison mediated this effect (Smolak et al, 2005). The impact of some sociocultural factors on body image may be positive for boys. In the same study, messages from mothers and female friends impacted positively on body image and in some cases, the media and social comparisons to other male's bodies (e.g. their father's), were viewed as promoting, and not reducing, body satisfaction. For some boys, there was no effect on body image of the messages at all. For girls, the media was not directly related to their body dissatisfaction, rather peer conversations around appearance and the media created an 'appearance culture' that lead to internalization of the thin ideal and subsequent body dissatisfaction (Clark & Tiggemann, 2006).

2.6.2.1. Dolls and action figures

Appearance ideals differ between cultures and over time and research around this (such as Pope et al, 1999) supports the sociocultural model confirming sociocultural ideals exist (Tiggemann, 2012). In Western culture, the ideal male body has become more muscular over time, reflected in the transformation of children's toys over the past thirty years, for instance, a study of plastic action figures available in America and aimed at boys, noted a marked increase in muscularity in a range of the figures, usually to that beyond the largest bodybuilders (Pope et al, 1999). In particular, there was greater visible muscular definition in the torso of the figures and most had much larger, muscular

shoulders and arms, than earlier ones. Some reflected muscularity unattainable by most human beings. Dolls aimed at girls, such as Mattel's® Barbie doll has also been criticised for her unattainable, unhealthy, overly thin proportions and can induce a feeling of body dissatisfaction in some children (Dittmar et al, 2006; Tiggeman, 2011a). One study measured the body proportions of Barbie and Ken dolls (Mattel®) and noted the large discrepancy in the dimensions when compared to normal healthy adults, thus children playing with the dolls are being exposed to unrealistic ideals for shape and weight (Brownell & Napolitano, 1995).

Although there is unlikely to be a direct cause and effect of early exposure to action figures and dolls and subsequent body image disorders, production of children's toys is a multi-million-dollar industry and it is probable that many children own these toys (Dittmar, 2006) and are exposed to these ideals. Mattel® estimates that 90% of girls aged 3 to 10 years old own at least one Barbie doll (Mattel Inc, 2012). In an examination of popular dolls marketed at children, 62% of the dolls were reported as having a thin body and 42.3% of action figures a muscular body (Boyd & Murnen, 2017). Playing with toys has an important role in the socialization process of children: through these the child internalizes their culture's values, ideals and behaviour and learns what is expected of them in later life (Sutton-Smith, 1997). According to the Symbolic Interactionist Perspective (Mead, 1934), toys can serve as role models for children, communicating expectations of appearance, personality and behaviour, which children internalize during play.

A child's self concept is developing in early to middle childhood (Eccles et al, 1993) and there is a developmental shift that occurs between the ages of 3 and 5 years old (Nelson & Fivush, 2004), and so the preschool years represent a critical period where sociocultural messages, such as those around ideal body shapes, are internalised and inform the self (Harriger et al, 2010). Barbie (Mattel®) has become a role model, providing appearance and lifestyle ideals for young girls to aspire to (Tiggemann, 2012). Internalization of a cultural ideal happens over different phases of play (Mead, 1934; Dittmar, 2012). Through

fantasy and play, young children identify with the toy at a simple level, for example a boy 'becomes' his toy and pretends to have muscles and demonstrates strength and power (Parsons & Howe, 2006). Over time, through a combination of exposure to media messages and social interaction with family and peers, a more complex identity develops which integrates the ideal body appearance, with what it means to be that person. Barbie, for example, is portrayed as happy, sociable and successful in many careers, as well as being thin (Mattel, 2009; Dittmar, 2012; Sherman & Zurbriggen, 2014). Consequently, children internalize the ideal identity and body image from these dolls and not only want to look like them, but also want to be them. As children get older and recognise multiple perspectives, they reject the dolls as role models, but may have already internalised the thinness or muscularity ideal (Dittmar, 2012). The impact of playing with these dolls can be far reaching, as research suggests Barbie communicates appearance-focused and sexualizing messages to girls as young as 3 years old and has even been shown to limit perceptions of future career options for girls (Sherman & Zurbriggen, 2014). In Sherman and Zurbriggen's (2014) study, girls playing with Barbie reported fewer future career possibilities for themselves than boys, compared to girls who played with the control doll.

Research into the impact of playing with muscular action figures on boy's body image is lacking. When male university students were asked to handle and manipulate action figures varying in muscularity, this significantly affected the body image of those touching them (Barlett et al, 2005). The students handling the more extreme muscular figures showed decreased body esteem, but not decreased self-esteem or body satisfaction. Baghurst et al (2007) used action figures with bodies varying in muscularity to find out which physiques 9 to 13 year old boys would like to resemble. Most boys chose the versions with the larger physique, recognising that it was not normal, but believing it was the healthiest.

Moreover, research conducted with girls reveals conflicting results. An early study using images of a thin doll (Barbie) and a fuller-figured doll (based on an

American model called Emme) showed that exposure to the images of the thin doll caused an increase in the younger girl's body dissatisfaction (Dittmar et al, 2006). Children aged 5.5 to 7.5 years old had lower body esteem and desired a thinner body, after viewing the thin doll. Interestingly, the older group of girls aged 7.5 to 8.5 years did not demonstrate body dissatisfaction after exposure to the thin doll. This could be due to the younger child's developing self-concept and greater identification with the doll as a role model at this age (see Mead, 1934). Also, the older girls' exposure to Barbie may have reached 'saturation point', where the thin-ideal was already internalized and further messages had no effect (Rice et al, 2016). In a replication of the study, playing with thin dolls did not influence body esteem or body dissatisfaction in 6 to 10 year old girls (Anschutz & Engels, 2010). However, Anschutz and Engels (2010) did find that the girls playing with the average sized doll ate significantly more food than those playing with the thin doll or a Lego control.

In support of this, Rice et al (2016) found that exposure to Barbie in any format (as a picture, doll, playing with the doll) did not have an immediate effect on body esteem or body dissatisfaction for 5 to 8 year old girls, but led to higher thin-ideal internalization, than contact with the control did. Jellinek et al (2016) investigated the impact of exposure to a thin (Barbie) doll and full-figured doll (Tracey) with 6 to 8 year old girls, and found that girls playing with the thin (Barbie) doll experienced lower body esteem, but not decreased body dissatisfaction. Interestingly, it was the girls playing with the Tracey doll who had deceased body dissatisfaction, but the type of clothes the dolls were dressed in (swimsuit vs modest clothes) had no effect on the girls' body image.

2.6.2.2. Dressing up clothes

Young children also spend a lot of time in make-believe play where they assume the role of a character, alike to when they are playing with dolls and action figures. They may use dressing up clothes to 'become' real or fictional characters. Make-believe play is important for children's development because taking on different roles allows children to express themselves in a variety of ways and rehearse real life situations, helping them to develop physically,

socially and emotionally and improve language and cognitive skills (Piaget, 1951; Vygotsky, 1978; Berk, 1994; Lindsey & Colwell, 2003; Johnson et al, 2005). Superhero play in particular, can give children a sense of mastery and empowerment (Kostelnik, 1986).

In a review of play literature, combined with a questionnaire study of 17 to 79 year olds, researchers found that since the advent of TV, the media (TV programs, fantasy-action shows and cartoons) had greatly influenced play themes more than other influences, such as siblings and parents (French & Pena, 1991). Interestingly, the play behaviour of children aged 7 to 10 years old in this study, pre and post TV, had not changed. However, for younger children aged 4 to 6 years old, the play behavior had. Younger children were not emulating 'real life' heroes such as firemen or parents, as the older children had done at their age, but instead were imitating artificially created superheroes, and identifying for them a narrower range of traits, such as strength and muscularity.

The author of this thesis is not aware of any studies investigating the impact of dressing up clothes on children's body image directly, although has noted a wide range of superhero action costumes aimed at boys that have padded torsos and arms to give the wearer a muscular physique. One popular retail outlet sells pyjamas for bedtime with the muscles illustrated. Some published research investigating commercial dressing up costumes for 3 to 8 year old girls, noted that the costumes exaggerated gender identity and provided stereotypical gender roles for girls (Pollen, 2011). The body shaping design and added features, such as lace, promoted femininity and provided a template for what it is to be a girl or woman. The author found the costumes provided narrow roles for girls, which restricted the imaginative identities available.

In much the same way, there are a narrow range of costumes aimed at boys, with an over emphasis on the muscular body shape. In support of this, Murnen et al (2016) found that products from popular culture (for example, dolls, action figures, and Halloween costumes) displayed gender-stereotyped

characteristics. Many male characters had characteristics consistent with traditional masculinity, such as functional clothing, or hyper-masculinity, where aggression was encouraged through the toys displaying angry facial expressions or with their hands molded into in a fist shape. The focus of female characters was on femininity and appearance, for example dolls were dressed in decorative clothing, thus reflecting societal expectations of women to be objectified. Moreover, self-objectification in females is associated with the development of depression and eating disorders (Moradi & Huang, 2008; Tiggemann, 2011b). An investigation into the effect of regularly dressing up in such costumes and the impact on body satisfaction is required.

2.7. Conclusions

Despite much research in the area, there still remain gaps in the literature for younger children and the lack of consistency with methods and samples is reflected in the varied results presented in this review for some of the factors influencing body dissatisfaction, such as age or ethnicity. There is a growing body of research exploring the impact of some sociocultural influences on body image in preadolescent children, but research around the impact of the media mainly focuses on television and images in magazines, and there is a lack of research into the media aimed specifically at children. Given the fact young children spend a lot of time engaged in role-play activities involving playing with dolls and dressing up in costumes, there is surprisingly little research conducted around this. The impact of playing with muscular action figures on boys' body image is limited and research with girls and dolls reveals conflicting results. Overall, much more research needs to be conducted to investigate the impact of different factors (such as dressing up clothes, age or gender) on preadolescent children's body image.

Furthermore, of high importance, is how body (dis)satisfaction is measured in children as the techniques used need to be appropriate for the age group under investigation. There are a variety of measures for use with adult samples, but these may not be suitable for use with preadolescent children. Therefore, a

review of the measures used to assess (dis)satisfaction in children is outlined next.

2.8. Review of current quantitative measures used to assess body size perception and body satisfaction in preadolescent children

Body image is a well researched area employing a wide range of methods and techniques (Ben-Tovim & Walker, 1991; Cash & Pruzinsky, 2002) and most researchers agree that it is a complex, multidimensional construct incorporating many variables, such as body shape, appearance and functioning. An individual's body image is comprised of perceptual and attitudinal modalities (see Chapter 2 for definitions) and researchers should differentiate between the two (Cash & Deagle, 1997; Cash, 2002; Gardner 2002; Bergstrom & Neighbors, 2006). These modalities are said to operate mostly independently of each other (Cash & Deagle, 1997; Keeton et al, 1990) and both should be included in body image research (Cash & Pruzinsky, 2002).

A search of the social scientific and health-related literature using PsycINFO and Web of Science databases with the following key search terms "body image," "appearance," "body attitude," "body perception," "techniques", "assessment," "methods," "preadolescents", "childhood", "children" and combinations of these terms revealed the three main quantitative techniques commonly used to measure body size perception and body satisfaction in children aged 4 to 11 years old. These are questionnaires, figural scales, and Video Projection Techniques. The methodological problems with these measures are reviewed and critiqued in this chapter.

2.8.1. Questionnaires

There are several questionnaires developed for measuring appearance dissatisfaction in preadolescent children. Most have adapted the questions and scales from adult and adolescent measures to make them more suitable for children. The most commonly used are discussed here.

The *Revised Eating Disorder Inventory—Body Dissatisfaction subscale* (Revised EDI-BD; Wood et al, 1996) from the original EDI-BD (Garner et al,

1983) is used to assess the level of body dissatisfaction with specific body parts, such as the hips or stomach. It comprises of 9 items, for example, “I think that my stomach is too big”. Items are rated on a 6-point Likert-scale, with response options ranging from “always” to “never”. Higher scores on the scale indicate a greater dissatisfaction with one’s body. The EDI is appropriate for use with older children and it has sufficient internal consistency reported with girls as young as 8 years old and boys from 11 (Wood et al, 1996). However, one problem is, although it looks at the evaluation component of body image, it only focuses on beliefs around hips, thighs, buttocks, and stomach because it was originally developed for women with eating disorders (Smolak, 2004). The Revised EDI-BD has good test–retest reliability (α = .79) and good internal consistency, ranging from .73 to .95 (Wood et al, 1996).

The Body Cathexis Scale (BCS: Secord & Jourard, 1953) requires children to rate their satisfaction – dissatisfaction on a 7-point scale for 15 body parts (for example, waist, thighs) and on features such as weight, height, and body build. Scores can be summed and a low score indicates very good feelings about the body. A mean score can also be calculated from the ratings. A problem with this measure is that children can be confused over which judgement of satisfaction they are being asked to make on each body part. They can be unsure whether they are required to rate satisfaction with the size, shape, function, or overall appearance of the body part (Hill, 2011). However, an advantage is that satisfaction with specific body sites can be measured, or overall body dissatisfaction can be calculated. In addition, an advantage of using the BCS is that Cathexis presents a more complete measure than others because it contains items that measure personal feelings about many body parts, including shape and weight satisfaction (Frost & McKelvie, 2004).

The Body Esteem Scale for Children (Mendelson & White, 1993) is a widely used assessment and has 20-items adapted from the 35-item adult version. It is typically used with children aged between 8 and 15 years old. It comprises of 3 subscales and was designed to assess children’s overall evaluation of their bodies, attitudes and feelings about their body shape and weight, and what they

believe other people's (parents and peers) evaluation of their physical appearance is. The child indicates how they feel about the part or function of their own body using a 1-5 Likert scale. This can be adapted to a two (Yes/No) or three-item response set (Yes/No/Sometimes) for younger children (as in Davison et al, 2000), or three pictures of smiley faces for pre-readers, where children can indicate their agreement or disagreement (as in Dittmar et al, 2006). Statements such as: ``I like what I look like in pictures,'' ``I'm proud of my body,'' ``I wish I were thinner'' are rated by the child. Scores are added and high values indicate greater body satisfaction. As with the Body Cathexis Scale, an advantage of this method is that overall body dissatisfaction or satisfaction with specific body sites can be measured. The BES also demonstrates acceptable internal consistency ($\alpha = .75$) when used with young children (Davison et al, 2000) and there is good validity and reliability data for its use with 7 to 12 year olds (Hill, 2011). Although when a brief measure using 9 items adapted from Mendelson et al (1996) was used, Dittmar et al (2006) found the youngest children had difficulties understanding the statements that were worded negatively and so these questions were removed to attain the same level of internal consistency. It also has sufficient test–retest reliability with children as young as 8 years old.

Another frequently used assessment is the Self Perception Profile for Children (SPPC: Harter, 1985) appropriate for children aged 8 to 14 years old. The SPPC evaluates self-esteem in five domains by using a 36 item self-report scale. One of the domains is physical appearance, which is measured by six items and the child is asked if they are happy with the way they look, if they like their appearance or feel they are looking good. Each SPPC item consists of two opposite descriptions, for example, "some kids are happy with the way they look BUT other kids are *not* happy with the way they look". Children have to choose the description that best fits and then indicate whether the description is somewhat true or very true for them. Each item is scored on a 4-point scale, where number 1 is taken as low perceived competence and 4 as high perceived competence. A higher score then, reflects a more positive view of oneself. For each of the self-esteem domains and for the global self-worth scale, a total

score is computed by adding relevant items. An advantage of this scale is it can measure perceived *importance* of physical appearance, which is not often investigated in children's body image studies (Hill, 2012). Harter (1985) believes measuring body dissatisfaction alone does not indicate the importance of appearance for the child, or indicate the consequences of body dissatisfaction for them (Hill, 2012).

Moreover, the SPCC demonstrates good internal consistency and test–retest stability and is a valid self report measure for assessing children's self-esteem on the different domains (Muris et al, 2003). However, Shevlin et al (2003) suggest researchers need to treat the scores with some caution, particularly in longitudinal studies, as scores are not initially temporally stable for 8 to 11 year old children. Also, the scale has been criticised for being repetitive and confusing for children and the structured response format used may cause children to respond in a socially desirable way (Eiser et al, 1995).

Many questionnaire measures were originally designed to assess body dissatisfaction in girls and so do not evaluate a desire for increased bulk or muscle size. However, published research exploring muscularity with children typically uses questionnaires adapted from existing ones: questions are added that focus on how important muscularity is to the child, and their level of satisfaction with current muscle size, which they rate on a Likert scale (see McCabe & Ricciardelli, 2003; McCabe et al, 2005). Holt and Ricciardelli (2002) modified the Children's Eating Attitudes Test (ChEAT) (Maloney et al, 1988) to include items around muscle bulk and exercising for boys and girls. The new items were constructed to evaluate the cognitions around muscle size and behaviour, for example, "I am unhappy about the size of my muscles", "I worry about the size of my muscles", "I think about increasing muscles when I exercise", "I exercise to become more muscular", "I eat food high in calories in order to increase my muscles" and "I think a lot about the muscles on my body". Responses are rated on a 5-point scale from *never* to *always* and the factor structure of the questionnaire differs for boys and girls. Research conducted

with these questionnaires generally shows that some girls want to increase the size of their muscles, but have a greater focus on weight, whereas boys place a higher importance on muscularity and are more dissatisfied with the size of their muscles (for example see McCabe et al, 2005). Due to the questionnaire method not being appropriate for use with younger children, those under the age of 8 have rarely been included in research around muscularity, and so it is not clear whether a desire for a muscular physique may appear earlier than 8 years old.

Overall there are issues with the questionnaire method when conducting research with young children, including preschool aged children. The limited cognitive capacity and linguistic ability of younger children suggests potential difficulty when understanding questions and interpreting Likert scales (Tatangelo et al, 2016). Moreover, questionnaires can take a longer time to administer than other methods and so may not be appropriate for very young children's limited attention span (Tatangelo et al, 2016). Most questionnaires have reliability and validity data from children aged 8 years old and upwards, but most are not validated for children under this age, and so it is uncertain whether they are the most suitable measure to use with younger children. Moreover, as body image is a multidimensional construct, some of the body esteem measures cover a broadly defined construct, without permitting the researcher to specify the body esteem problem (Smolak, 2004).

In Tangelo et al's (2016) systematic review of body dissatisfaction among preschool children (aged between 3 to 6 years old) it was noted that questionnaires such as the BES have not been used with preschool boys and so it is not known how reliable these measures are with boys of this age. Studies using questionnaire methods with preschool girls report a much lower level of body dissatisfaction in girls than other measures, such as the figure scales do (Tangelo et al's, 2016), thus presenting a different picture of body dissatisfaction in children.

2.8.2. Figure Scales

One method of assessing body satisfaction which has been used extensively with children is Figural Scales, also known as schematic drawings, contour line drawings, and silhouette scales. Most are adapted from Stunkard et al's (1983) scale (figure 2.1) and validated with female populations. For example, Collins (1991) (figure 2.2) redrew the outline figures to represent 7 girl or boy figures. There are many variations to the drawings such as in the clothing or the detail given to the hands, arms and facial features and figures can be positioned in a frontal view, side view or both.

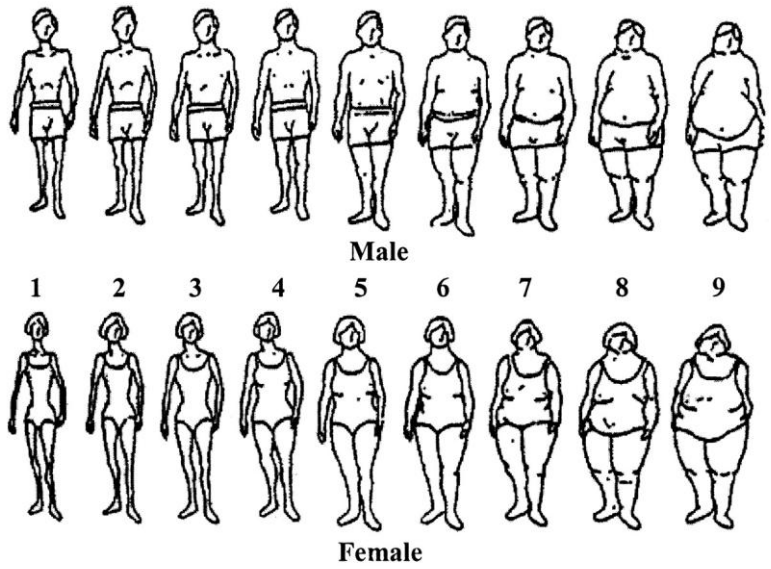


Figure 2.1- Figure scale by Stunkard, Sorensen and Schulsinger (1983)

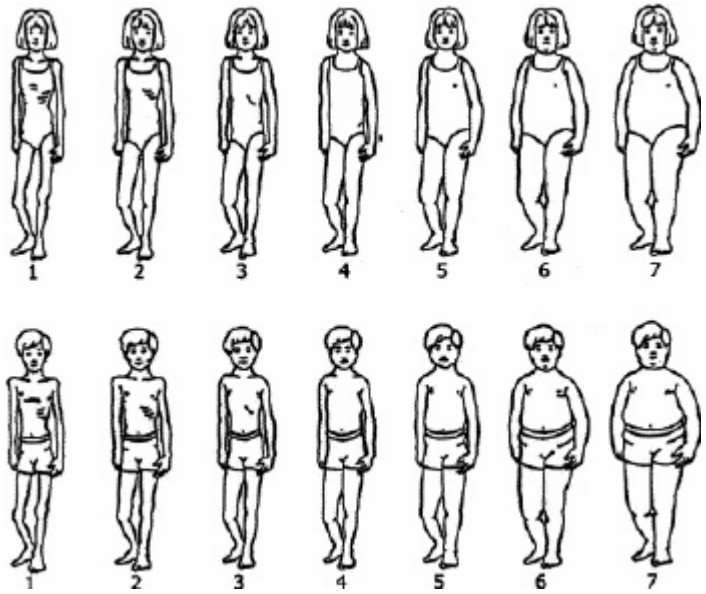


Figure 2.2 – Figure scale by Collins (1991)

These scales consist typically of 5-9 male or female figures varying in adiposity (body fat). The figures are usually line drawings that range from very thin (very underweight) to very fat (obese) and are numerically scored from 1-9. The child is presented with gender appropriate images and asked to select one to best represent their actual/current perceived body size (how they think their body looks now) and again for their ideal body size (how they would like their body to look). The difference between the actual and ideal scores gives a 'discrepancy index', taken to be a measure of body (dis)satisfaction (Gardner et al, 1998a). A score of zero indicates body satisfaction and 1-8 dissatisfaction. These scales have also been used to measure children's perception of others' ideals, with the child being asked to select a body shape their parents would prefer (see Hill, 2011; 2012). Tatangelo (2016) noted that preschool boys' body image has only been assessed using figure rating tasks to date.

The advantage of using figure scales with children is their ease of administration (Gardner & Brown, 2010a; Hill, 2011) and their visual appeal (Hill, 2011) which is important in maintaining the concentration of children under the age of 7 years old. Scales can be adapted to further reduce the time and attention required, for example, Tremblay et al (2011) used just three figures ranging from thinner to larger to make the task more suitable for preschool children. Figure scales can easily be incorporated into questionnaires for parents or children, so sample sizes can be large with minimal time or money constraints and they are also scored easily. Furthermore, they do not require verbal fluency (Truby & Paxton, 2002; Hill, 2011), enabling use with younger children who may lack the verbal skills for other measures. Most have published reliability and validity data, for example, they demonstrate good test-retest reliability in children aged 6 to 8 and above (Collins, 1991; Rand & Wright, 2000; Ricciardelli & McCabe, 2001; Hill, 2012). However, there is a lack of validity data for the scales used with children under 8 years old (Smolak, 2004; Pallan et al, 2011; Tatangelo et al, 2016).

Despite the advantages, there are reported issues with these scales as a measure of body size perception and body dissatisfaction in children,

adolescents and adults. Firstly, there are questions around whether the discrepancy index is a true measure of body dissatisfaction because of the use of a single, ambiguous difference score to measure the distinct constructs of 'self' body image and 'ideal' body image (Cafri et al, 2010). Also, in most of the reliability tests, the individual constructs (self and ideal) are assessed for their reliability separately, but the difference score is not tested (Thompson & Gray, 1995; Cafri et al, 2010). In addition, Rand and Resnick (2000) argue that it is assumed that a child shows dissatisfaction with their body if their perceived current (self) and ideal figures differ, but this does not take into account social acceptability of body shape. In their study, children aged 9 to 11 years old, adolescents and adults rated a range of body sizes they would find socially acceptable in given situations, thus demonstrating that an individual can rate their current body size as 'good enough' within the range of acceptable sizes even though it differs from their ideal figure. This reveals the complexity of body image where an individual can be fairly satisfied with their appearance, whilst also being dissatisfied with their body size (Cash et al, 1986; Rand & Resnick, 2000).

Thompson and Gray (1995) reviewed 19 sets of contour drawings and silhouettes used with adults and found that reliability and validity of most were poor. They identified problems with the figures themselves, such as being unrealistic representations of the human body, with uneven arms and legs and poorly defined facial and bodily features, for example, arms being drawn fixed to the body (Thompson & Gray, 1995). Some studies addressed this by using photographs instead of drawings. However, Pruis and Janowsky (2010) photographed participants and created fatter and thinner images of their bodies and compared participant's responses of those to line drawings in the Figure Scale, but found no difference in participant body satisfaction when using the different types of stimuli. Further, figures with more detail, such as facial features or hair distracted participant's attention from making purely size based judgements (Gardner et al, 1999b) and so some scales purposely obscure the faces. However, other research shows that this detail is preferred. When scales with more or less detail have been compared, both perform adequately (Hill,

2012). Moreover, as the boy and girl are not matched figure for figure in the scales, it is suggested they cannot be used to accurately reflect sex differences in the ratings given, but are often used to do so (Hill, 2011; 2012).

In addition, care must be taken in the way the figures are presented. If the drawings are presented on a single sheet of paper and ranging in ascending size from left to right across a page, a participant can readily identify the figure chosen previously and so can easily choose the same figure again (Gardner, 1996; Gardner et al,1998a). This can give artificially high test re-test results. To avoid this, figures should be presented on separate cards and in a random arrangement each time. However, Harris et al, (2008) identified that the presentation may also create demand characteristics. Studies that found a discrepancy between female participant's own ideal figure and one which males would find attractive (such as Fallon & Rozin, 1985), were asked to identify one directly after the other, and so participants may have given two different answers because they felt the researchers expected them to answer each question differently. In research with children, it is important that they should be told they can select the same figures if they wish to, as in the research conducted in this thesis.

A further problem with this method is that the figures do not always reflect the ethnic backgrounds of the participants who are using them, and do not account for cultural and racial differences (Gardner, 2002; Hill, 2011). Most scales are developed primarily for Caucasian populations and the figures have stereotypical Caucasian features (Collins, 1991; Gardner, 2002). However, some scales have been updated to reflect different racial backgrounds. For example, the Children's Body Image Scale (CBIS: Truby & Paxton, 2002) (discussed in more depth later) uses identical bodies as per the original CBIS, but three different heads are available, including a modern Caucasian head, a South East Asian head and one with a blurred face. Moreover, the Collins Figure Rating Scale has been modified for a Chinese population (Li et al, 2005). Nevertheless, as these scales are often developed with Caucasian populations and adapted for different ethnic groups by changing skin tone and facial

features, the use of the same body may not reflect the variation in fat distribution between different ethnic groups as found in obesity research (for example see Ujcic-Vourtman et al, 2011). As research is generally conducted with Caucasian American and Australian children, body image experiences have not been fully explored across different ethnic groups (Smolak, 2002; 2011) and the scales used reflect this.

Similarly, another criticism is that in using generic figures, these measures present young children with the developmental challenge of thinking of the figure as a representation of self (Hayes & Tantleff- Dunn, 2010). In an attempt to overcome this, Hayes and Tantleff- Dunn (2010) created computer generated figures and added digital photographs of the participants' faces to the image. This allowed the skin colour of the face and body colour to be matched for each child, to better reflect racial differences. It also created a more personalised image the child could identify with.

Gardner et al (1998a) reviewed the methodological concerns from 15 studies that used silhouettes and identified issues with the scale itself, such as 'coarseness of the scale'. Studies have shown that information is lost when the continuous or 'fine' variable 'body image perception' is limited to a coarse response scale of 5-9 'discrete' images. A participant cannot choose an image that would lie between two images and so are forced to choose one or the other. Consequently, Hill (2011) has addressed this issue by drawing a 100mm line below the figures to serve as a visual analogue scale and this has allowed choices to be made between the figures, permitting a wider range of responses.

In addition, there is a restriction of range within these scales. Figural scales generally have between 5 to 9 figures, but Gardner et al (1998a; 1999a) suggest this is misleading because participants only select from a small range of figures. In fact, 85% of children selected from only 3 of 8 possible figures (Gardner et al, 1999a). This limits the study of individual differences because the variance is reduced (Wertheim et al, 2004), and it artificially increases the test-retest reliability.

Another problem with the scale is that the graduations in shape between the figures are usually visually based, rather than by mathematical calculation (Hill, 2012). As most are not based on a measurable index of adiposity (Truby & Paxton, 2002), and the size changes in body parts/ increments between one figure and the next are not standardised into equal intervals, the argument is that the scores do not represent interval data (Gardner et al, 1998a). Researchers then, should not use parametric tests to analyse the data, and many are claiming significance where there is none (Gardner et al, 1998a). However, although this is acknowledged, the convention in body image research has been to treat the scores as interval data (for example, see Cohn et al, 1987; Collins, 1991; Ricciardelli et al, 2006).

Truby and Paxton (2002) developed the CBIS to address the scaling issues and based the size of the figures on real anthropometric measures. The CBIS is a pictorial scale used to measure body perception and satisfaction in children aged 7 to 12 years old where the 7 body pictures represent standard percentile curves for body mass index (BMI) for healthy children. The figures were matched to the BMI International percentiles for ten year olds in 2008. This measure comprises of separate scales for boys and girls incorporating photographs of real bodies and is used in the same way as the figural scales to give perceived current and ideal body sizes. An advantage is it allows the accuracy of children's body size perception to be calculated by comparing the figure chosen with a child's measured BMI. Truby and Paxton (2002; 2008) found the CBIS to provide a good measure of body size satisfaction in children and body size perception in girls and an adequate measure in boys aged 8 years old and older. It also has good validity scores and test-retest reliability (Hill, 2012).

However, there are questions around whether BMI is an appropriate measure to use (as discussed in chapter 4, section 4.3.1.2), and there are issues around scale reliability because of the modest correlations between current-self and actual BMI ratings (Hill, 2012). The CBIS may not be a strong measure of current body size perception. It was found in Truby and Paxton's (2002) study

that accuracy of body size perception developed with age and depended upon gender, but the measure was found to be inappropriate for body size perception in boys aged 7 years old or below. Furthermore, many of the boys in different age groups struggled with the task, and younger boys in particular could not match their own body size to a figure of similar BMI. It could be concluded that younger boys have difficulty perceiving their current body size, but in research employing a video projection technique, Gardner et al (1999a) found no difference in accuracy of body size perceptions between boys and girls aged 6 to14 years old and so the problem may lie with the measure itself (Truby & Paxton, 2002). A possible explanation is that children may misinterpret how they perceive themselves, in comparison to figures or photographs of different body shapes (Baghurst et al, 2007). Moreover, other studies using a figure scale matched to BMI, found a significant correlation between selected figures and actual body size in children as young as 7 years old (Pallan et al, 2011), and 5 to10 year olds were able to correctly identify their body size (Dowdney et al, 1995; Williamson & Delin, 2001).

In contrast to this, there is much research that shows children seem to under or overestimate their body size and weight (Brault et al, 2015; Cattelino et al, 2015) and there seems to be a bias towards underestimation of body size shown by children of higher weights in some studies (see Elgar & Stewart, 2008; Saxton et al, 2009; Veldhuis et al, 2017; Wang et al, 2009; Zeller et al, 2010). With such diverse findings, it is difficult to draw conclusions around the accuracy of children's perceived, current body size, and actual BMI body size ratings. In addition, this inaccuracy may not be an issue unless the aim of the research is to investigate accuracy of perceived body size. Much research focuses on measuring body satisfaction using the difference between current self and ideal ratings, and so accuracy of current body size ratings may not be important.

A further limitation with figure scales is that they provide a global measure of body satisfaction where judgements are made about the whole body, rather than individual body parts (Gila et al, 2005), thus (dis)satisfaction with individual

body parts cannot be expressed. For example, a child may be satisfied with the size of their arms, but not their legs. When making a whole body judgement, there is the potential for information to be lost because the individual has to make a compromise between which whole figure to choose to best represent their thoughts and feelings about their body parts. Evaluation of the whole body is distinct from satisfaction with individual body parts (Ben-Tovim & Walker, 1991) and the limited research investigating this suggests variations between body parts by gender, for example, adolescent boys were least happy with their shoulders (Rauste-von Wright, 1988) and adolescent girls with their bust, hips and thighs (Davies & Furnham, 1986). It appears it is the body parts that change during puberty that girls feel the greatest dissatisfaction with (Davies & Furnham, 1986; Rosenblum & Lewis, 1999) and these areas continue to be a concern for women too (Monteath & McCabe, 1997).

Moreover, in a study of 11 to 18 year olds, anorexic boys were concerned with their shoulders, hips and thighs and non-anorexic boys their thorax, waist, hips and thighs (Gila et al, 2005). As they get older, adolescent boys and girls become happier with their overall appearance, but girls still demonstrate dissatisfaction with their hips, thighs and waist, whereas boys become more satisfied with individual body parts (Rosenblum & Lewis, 1999). This suggests there could be a need for a scale for children that measures individual body parts to give a more accurate picture of body satisfaction. In addition, it is important to keep the individual scores separate where possible. If an overall body dissatisfaction score is attained by adding individual body parts, it can be misleading if satisfactory and dissatisfactory body part scores are combined (Rosenblum & Lewis, 1999).

Furthermore, a problem with some of the research using measures that explore body dissatisfaction is that they do not give the direction of dissatisfaction, and so are not showing the full picture that some children want to be bigger (Smolak, 2002). Where dissatisfaction scores are averaged and there is no apparent discrepancy between boy's current and ideal figures, such as in Gardner et al's (1999a) study, information is lost: the combination of results

cancel each other out when equal numbers of boys desire smaller (thinner) and larger (heavier) figures (McCabe & Ricciardelli, 2004). For this reason, it is advisable to report the direction of dissatisfaction, where a negative score demonstrates a desire to be thinner and a positive score a desire to be heavier (Dion et al, 2016).

Finally, figure scales are limited because they are based on adiposity and do not include muscularity, and so they fail to explore a central concern of males (Cafri & Thompson, 2004). Much research shows some boys (and girls) choose an 'ideal' figure as one that is heavier than their current body size and usually the overweight figure (Collins, 1991; Markovic et al, 1998; Schur et al, 2000; Truby & Paxton, 2002; Musher-Eizenman et al, 2003; Brann, 2010) which could indicate the desire to have more bulk. Some parents also choose the overweight figure as an ideal figure for their boys (Brann, 2010). What is unclear from this research is whether the boys' and their parents' desire for a heavier figure is a desire for higher body fat, or higher muscle mass (Smolak, 2002; Brann, 2010). Limitations with the scale means it does not allow for a more muscular choice and so boys could be viewing the overweight figure as having bulk and confusing this with muscularity, or participants are choosing the overweight figure to represent a muscular one as a compromise. In their review of body image literature, Cohane and Pope (2001) suggest many studies fail to distinguish between leanness and muscularity, and although it is now accepted that there are these two distinct pathways to developing body dissatisfaction for adolescent boys and men (Jones & Crawford, 2005; Ridgeway & Tylka, 2005; Tiggemann et al, 2007), scales for boys seem to not include the assessment of both. There is a need then, for a measure that clearly separates bulk, due to adiposity, and bulk due to muscle, so children are not confused over the two dimensions, as apparent with other figure scale measures (see review by Cohane and Pope, 2001).

2.8.3. Video Projection Technique

Using this measure, a digital photograph is taken of the child and their body is projected as a life-sized video image onto the wall. The child then adjusts light

beam apparatus to change the image of their body to their perceived size. Accuracy of perceived body size can be calculated and the scale is highly correlated with BMI and body weight (Gardner et al, 1999a). Additionally, this measure was found to be reliable and valid (Gardner, 2002). This assessment is very precise because the computer program allows the researcher to measure the actual changes in the image made by the participant. These can be represented as a percentage of change at 5 body sites: the chest, waist, hips, thighs, and calves and so it can measure dissatisfaction with body parts as well as the whole body. It was found that participants overestimated body size less with this method than with figural drawings (Gardner, 2002).

An advantage of this method for use with children is it is a novel task that holds younger children's attention (Gardner, 2002). Additionally, this method addresses several limitations of other measures such as the coarseness of the scale because the scale is continuous and by adjusting size of image, children are not restricted to choosing discrete figures (Gardner et al, 1999a). Unlike the silhouette method, the computer measurement has been said to evoke a more insightful, personal, and realistic appraisal of body image because participants are confronted with an image of themselves rather than with the representation of line drawings of stylized images (Gardner, 2002). Gardner et al (1999a) believe the computer manipulation method produces a sum of perceptual, cognitive, and affective responses to the five body sites, and these may differ in importance or intensity, or both. In using the child's own image, it overcomes problems of realism of the figures and representation of different ethnic groups as well (Sands et al, 2004).

However, a disadvantage of this method is in its complexity. Firstly, the computer program takes time to develop (Gardner & Brown, 2010b) and the complex instructions meant the procedure had to be explained several times to the children (Gardner et al, 1998b). The authors noted that younger children needed many practice trials, so the process was time consuming, and the children may not have fully understood what they were doing.

2.8.4. Age appropriate visual stimuli used in tasks

It is important when conducting research with young children that researchers choose assessments, materials and procedures sensitive to the child's needs (Hill, 2012). Often drawings used are unrealistic and of poor quality, causing young children to respond in a socially desirable way (Harrison et al, 2016). Researchers should ideally choose familiar visual stimuli and tasks that mirror what children see and do in real life. Studies should be conducted within a safe environment the child is comfortable with, such as in the school setting. The story book is one approach where cartoon-like pictures or photographs of figures with different body shapes are combined with a storyline. Storybooks are a versatile media typically used to investigate stereotypes around different sized figures and explore the attributes assigned to them (see Harrison et al, 2016), and are good at engaging young children in the task (Hill, 2012).

A typical storybook would include a number of simple short stories about different scenarios and after the child has heard the story, they are asked to pick the character that best represents the attribute(s) being represented in the scenario (see for example, Cramer & Steinwert, 1998). The use of a storybook can make the task less abstract for children than merely assigning attributes to figures or giving ratings on a Likert scale. Harrison et al (2016) further developed the story book task to include characters from a reading scheme used in the school where the study was taking place. An advantage of this was the children were already familiar with the characters in the book and were used to taking part in similar activities in school (Hill, 2012).

In addition, dolls have also been used as visual stimuli to investigate different aspects of body image and are chosen because of their popularity with the age group being studied (Rogers, 1999; Jellinek et al, 2016). However, given the fact young children acquire their knowledge by handling concrete objects, surprisingly few studies have drawn on these (Worobey & Worobey, 2014). In Ditmar et al's, (2006) well known study, pictures of an average sized Emme doll (Tonner Doll Company®) and thin Barbie (Mattel®) were used to explore a link between 5 to 8 year old girls' exposure to dolls and body image. In a replication

of the study by Anschutz and Engels (2010), actual dolls of different sizes were utilized, instead of the images, and the girls were allowed to manipulate and handle the toys as they would during a real life play situation. In another study, Barbie (Mattel®) and a full-figured doll, Tracy Turnblad (Play Along®), were used to explore the impact of exposure to dolls of different body types and wardrobes (those wearing swimwear or modest clothes) on 6 to 8 year old girls' body dissatisfaction (Jellinek et al, 2016). Moreover, Worobey and Worobey (2014) also made use of dolls of three different body builds when assessing body size stigmatisation in 3.5 to 5.5 year old girls, and again, girls were allowed to interact with the dolls. Boys are not as often involved in studies using doll stimuli. However, Baghurst et al (2007) had action figures in their study with 9 to 13 year old boys. Boys were asked to look at the action figures with varying muscular physiques, but were not permitted to handle them in order to avoid selection bias by texture, which resulted in reduced the realism of the task.

An advantage of using dolls over images is it is thought they evoke stronger feelings from the children (Worobey & Worobey, 2014). Interestingly though, Anschutz and Engels (2010) found the use of dolls influenced body image less so than as found in Ditmar et al's (2006) study and believed this was because in using images, the exposure was similar to that of exposure to thin models in the media, and so body image was more negatively affected because the media imposes appearance norms for children (Lawrie et al, 2007). In utilizing real dolls, girls may face less pressure because they are in control of the play and the environment is not setting norms for them (Anschutz & Engels, 2010). This suggests that researchers need to carefully consider the choice of the visual stimuli they use.

However, Rice et al's (2016) research challenges this notion, they compared the different stimuli in three different formats: observation of pictures of Barbie; observation of the Barbie doll and physical engagement with the doll. They found that, irrespective of format, the girls experienced higher thin-ideal internalisation from exposure to Barbie than exposure to the control.

Where dolls are used, care must be taken to ensure they only differ in one characteristic. This was not the case in some of the studies described, as different types of dolls were used to represent the thin doll and full figured doll and so they differed in aesthetics, such as hair colour and proportions, like their height (see Dittmar et al, 2006; Anschutz & Engels, 2010; Jellinek et al, 2016). Therefore, there may have been a confounding effect of the difference in height or aesthetics of the dolls on the results. Future research needs to use identical dolls that only vary by body size (as in Worobey & Worobey's 2014 study) to investigate the effect of these dolls on body dissatisfaction (Jellinek et al, 2016).

2.9. Conclusions

What is clear from the review of the literature is the complexity of body image and its measurement. No one method exists that gives a comprehensive picture of body image and the issue with the availability of a variety of techniques used to evaluate body satisfaction is the lack of consistency where different measures give different results (McCabe & Ricciardelli, 2004; Pallan et al, 2011) and the same technique can produce different findings with various groups that may not reveal the true pattern of body dissatisfaction (Tiggeman, 2004). For example, body dissatisfaction can range from 20% to 70%, depending upon the method employed (Tangelo et al's, 2016).

Measures for assessing children's body image, especially those for children under 10, are limited, and not as comprehensively developed as those available for adults and adolescents (Smolak, 2004; Pallan et al, 2011). New, valid and reliable measures need to be created for young children and existing ones more rigorously psychometrically evaluated (Pallan et al, 2011). Overall, questionnaires and figure scales lack validity data for the use with children under 8 years old and research requires data showing at what age the current, ideal and consequently body dissatisfaction measures become reliable (Ricciardelli & McCabe, 2001; Smolak, 2004; Pallan et al, 2011; Tatangelo et al, 2016).

The development of an effective measure of body size perception and dissatisfaction needs to take the issues discussed in this chapter into consideration. It is important to have measures that are sensitive to the age of the children. Complex tasks place unreasonable cognitive demands on the child so any measure should be easy to use without complex instructions. Young children, or those with English as an additional language, may struggle to verbalise their ideas, so the task must be preverbal. Therefore, despite their limitations, figure scales can be appropriate to employ with young and preadolescent children as they are simple to use and administrate, the visual element holds attention, and a verbal response is not required (Hill, 2011; 2012). The development of more accurate techniques to measure body image, that address several existing issues raised in this chapter, are discussed in chapter 4.

Moreover, one of the problems with existing scales that measure body dissatisfaction in children is they are based on adiposity and do not show muscularity and thus fail to fully explore males' concerns around body image (Cafri & Thompson, 2004). The review of the literature identified the need to clarify whether boys and girls who choose an overweight figure as an 'ideal', desired higher body fat, or higher muscle mass, and whether they were picking the overweight figure to represent a muscular figure because the scale did not allow a muscular choice. Questionnaire methods are typically used to explore children's desire for muscularity, but cognitive demands of this measure mean this research has only been conducted with children aged 8 years old and above. There is a need then, to develop a visual measure that does not challenge young children's cognitive ability and that incorporates muscularity with adiposity into the scale, in order to investigate body dissatisfaction in young boys and girls. In addition, figure scales usually require judgements to be made about the whole body, thus satisfaction with individual body parts cannot be expressed. The literature revealed that both boys and girls can show varying levels of satisfaction with different parts of their bodies and so a scale that measures individual body parts could also be required to gain a more accurate picture of body satisfaction in the preadolescent age group.

Chapter 3

Aims and Objectives:

3.1. Objective 1 of the thesis: Improving measures

The review of the current quantitative measures used to assess body size perception and body satisfaction in preadolescent children highlighted the need for improved measures to assess body satisfaction in children aged 4 to 11 years old. The following aims were formulated:

3.1.1. Aim 1: To address some of the current limitations of visual scales assessing body satisfaction in young children

Visual tasks will be developed to be used with young children aged 4 to 11 years old in their school environment. The measures will incorporate muscularity alongside adiposity and the direction of body (dis)satisfaction recorded. A body satisfaction jigsaw will be used in two studies to assess body part satisfaction at 3 separate body sites (arms, legs and torso). In addition, a figural scale assessing body satisfaction with the whole body will be developed for two further studies. The scale will be modified after each study based on an evaluation of the results, and also after assessing ease of use and whether it meets the needs of the children.

3.1.2. Aim 2: To develop a prototype of an application for a portable touch screen mobile tablet device to measure body satisfaction in children

Several existing issues with the figure scales are required to be addressed. These include: incorporating muscularity alongside adiposity; assessing satisfaction at 3 separate body sites (arms, legs, torso); using realistic figures based on a measurable index of adiposity; photographing and using the child's own face and positioning it on the body; developing a continuous scale and gathering and storing information safely into an online database.

3.2. Objective 2 of the thesis: Filling gaps in the literature

The current research aims to fill some of the gaps in the literature around weight, muscularity and body dissatisfaction and attempts to clarify inconsistencies in current research by exploring the development of body image

in young children aged 4 to 11 years old. A series of 4 studies will be conducted to address the aims and more detail is provided within chapters 5 to 8:

3.2.1 Aim 1: Investigate the role of different factors on children's body dissatisfaction

The factors include: age, gender, ethnicity, BMI, body composition, perceived body size, and inclusion of muscularity alongside adiposity in the scale. Assessment of separate body parts (torso, arms and legs) will be included in the analyses of each study where relevant.

3.2.2. Aim 2: Explore children's internalisation of the cultural ideal body type for their sex

Children's ideal and averted choices for the self and future adult will be investigated.

3.2.3. Aim 3: Examine children's awareness of cultural ideals

Children's choices of ideal body types for males and females of different ages and their perceptions of what body ideals the opposite sex will choose will be explored.

3.2.4. Aim 4: Explore awareness and internalisation of cultural stereotypes towards body size and shape

The positive and negative attributes, including friendship choices children assign to bodies that vary in adiposity and muscularity, will be investigated.

3.2.5. Aim 5: Understand the sociocultural influences on boys' choice of ideal body and body satisfaction

Factors that may influence body dissatisfaction and choice of ideal figure will be explored. These include parental influence, children's media and toys, and family involvement in exercise.

Chapter 4
General Methodology:

4.1. Ethical requirements

Ethical approval was gained from the University of Bradford Ethics Committee prior to each study (Appendix 1). Schools from the Leeds and Bradford area in the UK were recruited via an email giving an outline of the study's aims and the school's involvement. Further details of the study were emailed if the school expressed an interest to take part (see Appendix 2). Visits were made to each school to gain permission from the Headteacher to conduct the study in their school, to give further information about the study and to answer any questions they had. The schools recruited for studies 1 and 4 were from the Leeds area and pupils were predominantly middle class and White British (see details of ethnicity given in each study chapters 5 to 8). The schools for studies 2 and 3 were from the Bradford area and the pupils were predominantly working class and from a more diverse range of ethnic groups.

Participants were recruited through the schools. Detailed information letters giving a full explanation of the study were distributed to each child by the school and given in the newsletter sent to parents via email (see Appendix 3). Parents were given the option to either ask questions and/or withdraw their child from these activities. Parents were informed that every care would be taken to ensure that any child who could not take part in the study did not feel left out of the activities. They could have the opportunity to play with the task materials if they wished to, and were given the same sticker as the children who took part. The right to withdraw from investigations at any time was made clear to parents and this involved removing all of the child's and/or parent's data from the study.

For studies 1 to 3 (chapters 5, 6 and 7), children whose parents had signed the school's generic consent form giving permission for their child to take part in research initiatives taking place in a game play or classroom scenario in school, and had not withdrawn consent, were visited in their classroom. The children were given an age appropriate brief outline of the study (see Appendix 4) and

asked if they wanted to take part. Children who gave their assent were taken individually by the lead researcher to a quiet area of the school, seated at a table and the task was demonstrated to them. The child was asked again for their verbal assent if they wanted to take part and children who did not want to were given a sticker and taken back to their classrooms. For study 4 (chapter 8), parents with at least one boy at the school were invited to complete the questionnaire and sign the form giving consent for their child or children to take part in the study. Assent was gained from the child (as above) on the day of the study.

The researcher was sensitive to the potential impact on the child of taking part in the research (BPS, 2014). Due to the age of the children and in studies with more than two conditions, children were given a break between each condition as required. Throughout the tasks, care was taken by the researcher to ensure the child fully understood what they were being asked to do through careful questioning and modelling as required. Children's spontaneous comments throughout the task indicated that they understood what they were being asked to do (alike to Williamson & Delin's 2001 study), "I want these arms cos they're muscly and I want to be like this" (Boy aged 5), "I like these legs cos they're skinny and girls have skinny legs" (Girl aged 6). Some children made comments suggesting they were unhappy with the way they looked, "My tummy's too fat. It looks like this one" (pointed to the overweight picture card: Girl aged 8), "I don't like my legs, they're too thin, I like these ones" (pointed to the normal weight legs. Boy aged 9). Some children expressed satisfaction with how they looked, "Well I like the way I look. I want to get the same pieces again" (Girl aged 10).

One of the studies required the children to have developed Theory of Mind (ToM) and during these tasks children were assessed carefully by the researcher to ensure they had the required understanding to take part (see chapter 6 for further discussion).

Children were monitored for any signs of not wanting to participate through their behaviour and/or becoming upset and/or their verbal expression. If any child did

not fully understand the task, or appeared to not want to take part at any point during the activity, they were thanked for taking part in the study, given a sticker and taken back to their classroom. Any data collected was removed. Older or more mature younger children (assessed as more mature if they asked questions about the task, or demonstrated an interest in understanding the purpose of the task) were given an age appropriate debrief of the study's aims and their involvement following completion of the task (see Appendix 5).

4.1.1. Inclusion and exclusion criteria for participation

No children who took part in the study were identified by their parents or teachers as having undiagnosed/diagnosed eating disorders, weight issues, and/or body issues. All children were assessed by their teachers as having a good understanding of spoken English and able to understand the task instructions. Children who were assessed as not having a good understanding of English and/or able to understand the task instructions, and where support was not available to enable inclusion, were excluded from the study. As the task was non-verbal, children with any speech problems were included as appropriate.

4.1.2. Confidentiality and anonymity

The identity of the participants was not revealed. Children's names were not recorded and the child's date of birth (dob) was only used for the purposes of calculating the child's chronological age. Names and dob were not included in any tables or in the analysis. The figures and scores recorded were not related to the identity of the participants and as participants were not identifiable from the data or linked to the data collected from them, confidentiality and anonymity was maintained. Personal data and data collected was protected from being obtained or misused by others. All data was password protected and only the lead researcher had access. In accordance with the Data Protection Act and the school policy, school generated class lists (which included children's names, dob and ethnicity used for identification purposes during the task) were not removed from the school during the research period, and were given back to the school to be destroyed at the end of the research.

4.2. Materials

The most important feature in measuring body image in males is that the scale used measures muscularity (Cafri & Thompson, 2004) and so the assessments developed for use with the children in the following 4 studies incorporated muscularity and adiposity together into the scale.

To enable satisfaction with individual body parts to be measured a Body Parts Satisfaction Jigsaw was constructed for studies 1 and 4. The jigsaw task was also chosen for its tactile nature and to encourage the young children to engage in the task due to being required to handle and move the pieces. Research suggests men are most dissatisfied with their abdominals, arms and upper torso (Hatoum & Belle, 2004), with the upper torso being an area of particular concern for males (Thompson & Tantleff, 1992; Garner, 1997). Females are mostly concerned with their lower and mid torso (Cash & Henry, 1995), hips, thighs and waist (Rosenblum & Lewis, 1999). The Body Parts jigsaw was designed to assess just 3 body parts separately to ensure simplicity of the jigsaw design and ease of administration of the task with young children. For this reason, the upper torso and abdominals were combined into one torso piece, and the arms and legs were assessed separately. Thus the jigsaw comprised of 3 body parts, the torso, arms and legs.

4.2.1. Materials for study 1

A total of 9 figures which varied in muscularity and adiposity were drawn with 1.5 mm increments between each of the 5 figures which differed in adiposity (see figure 4.1). The size of the torso for the 4 muscular figures was held the same as the normal weight figure, but different levels of muscular definition was added. Each figure was cut into three pieces to make the Body Parts Satisfaction Jigsaw which comprised of a torso, a pair of arms, and a pair of legs. Pieces were laminated so children could overlay and fit together the arms and legs with the torso easily (see figure 4.2). Children were asked to construct their perceived ‘current’ body size and their perceived ‘ideal’ body size by fitting together their chosen pair of arms and pair of leg pieces with the torso (see section 4.3.3.1. for more detail about the current and ideal figure jigsaw task).

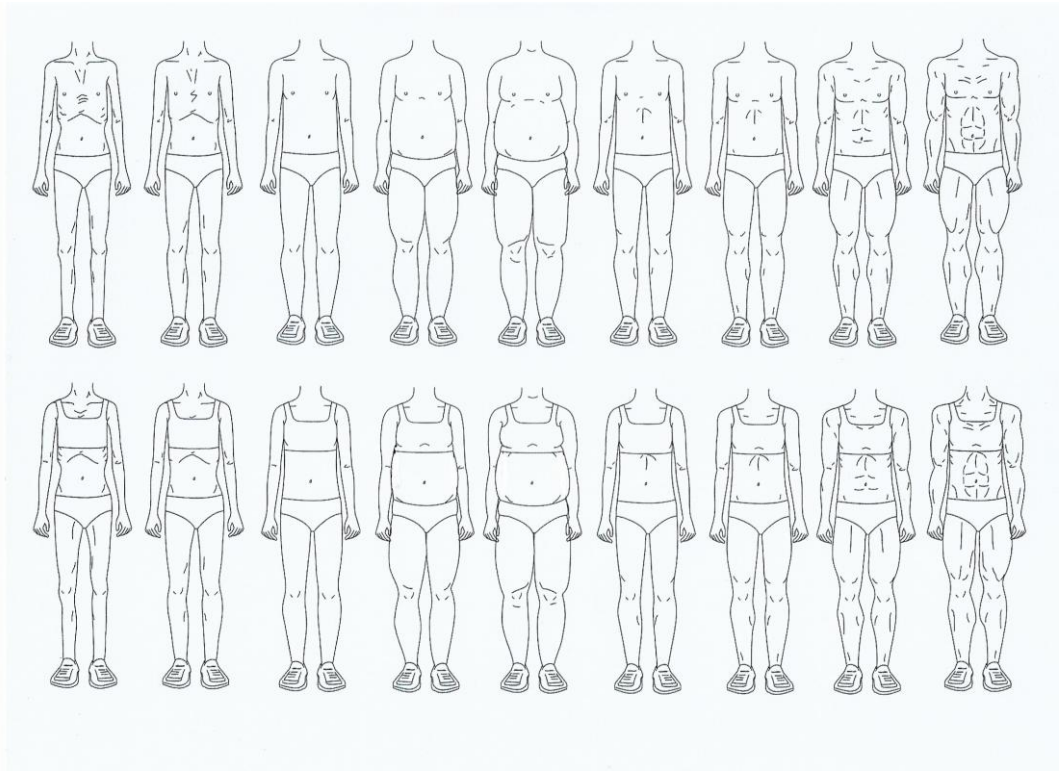


Figure 4.1 - Child figures varying in muscularity and adiposity

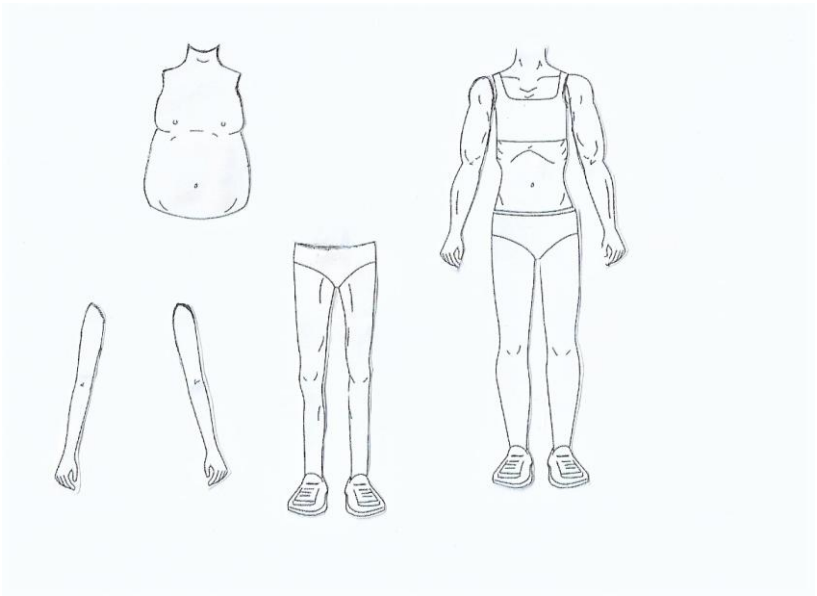


Figure 4.2 - An example of the body jigsaw pieces and jigsaw pieces fitted together

In total, there were 9 torsos, 9 pairs of legs, and 9 pairs of arms, which all varied in muscularity from no muscles to hyper-muscular, or differed in adiposity from

underweight to obese. The use of three body parts allowed children to combine muscularity and adiposity if they wished, for example, they could select muscular arms, but non-muscular legs for their body. Figures for study 1 were shown as black ink on white paper. A girl version wearing identical pants, vest top and trainers for each figure and a boy version wearing pants and trainers was made.

4.2.1.1. Scoring

Each body part (arms, legs and torso) was given a number 1-9 on the reverse for later identification purposes. The numbers 1-4 represented more muscular (hyper-muscular) to less muscular figures. Numbers 5-9 represented a change in adiposity from an underweight figure to an obese figure.

After the children had constructed their perceived current or ideal body size, the number of each individual body part (torso, arms and legs) was recorded. Individual body part scores were recorded for both tasks giving 2 pairs of numbers for each body piece selected. To calculate the child's body satisfaction, the perceived current body part number was taken from the perceived ideal body part number and the difference between the pairs of numbers gave a 'discrepancy index' (Gardner et al, 1998a) or 'discrepancy score' measure of body satisfaction. The separate numbering of the three body parts allowed the researcher to identify whether the desire for muscularity or adiposity varied with different parts of the body, and whether satisfaction differed between individual body parts without losing this information within a combined score. The satisfaction score calculated ranged from 0 (satisfied) to 8 (very dissatisfied) for each body part.

In addition, the number of the perceived current body part the child selected that was recorded was used to categorise the child into a current body size group. For example, children choosing body parts numbered 8-9 were categorised into a perceived overweight and obese group, number 7 into a perceived normal weight group, 5-6 a perceived lean group, and 1-4 a perceived muscular group. From this a calculation was made about the amount of dissatisfaction and its

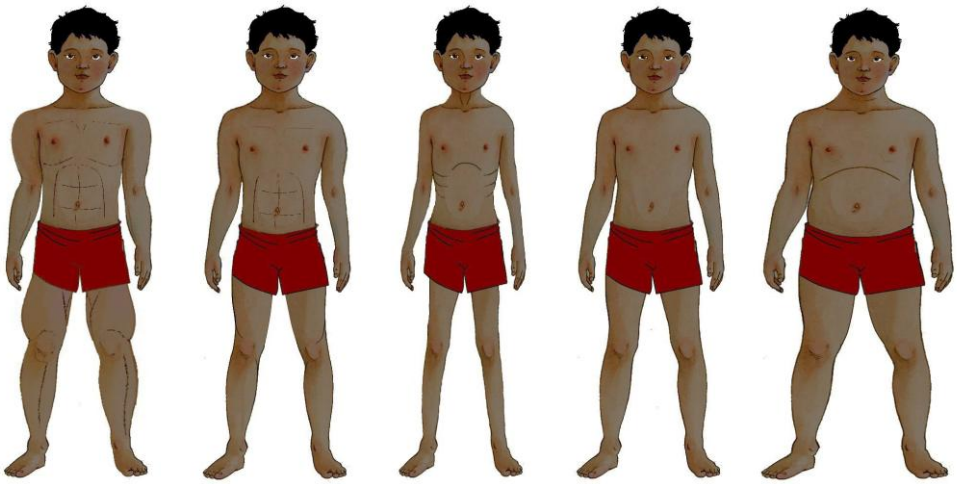
direction by subtracting the current body size number from the ideal. A score of zero indicated the child was satisfied with their body and did not desire an alternative physique. A negative score indicated the dissatisfaction was in the direction of wanting to be leaner and or more muscular, depending upon the current body size of the individual and the size of the discrepancy score. For example, a child who perceived their body as overweight or obese and chose figures 8-9 with a score of -2, desired to be leaner whereas a score between -4 and -9 suggested a leaner and more muscular physique. A child who perceived their body as the normal weight figure 7 with a score of -1 or -2 desired a leaner figure, or -3 to -6 suggested a desire for a leaner and more muscular physique. A positive score indicated the child wanted to be less muscular and, or have more body fat (again this depended upon the current body size and discrepancy score). This was calculated for each body part and as the body part scores remained separate, different patterns of dissatisfaction for each body type could emerge.

4.2.2. Materials for studies 2 and 3

Studies 2 and 3 required complete figures to be used rather than individual body jigsaw pieces because the children were asked to choose an ideal other than themselves for part of the task and it was felt they would have difficulty integrating individual body parts into a whole when they perceived a figure that was not their own. Moreover, the scale was adapted to further reduce the time and attention required, for example, Tremblay et al (2011) used just three figures ranging from thinner to larger to make the task more suitable for preschool children, thus for this scale the number of figures that varied in body size was reduced from 9 to 5.

Two types (Asian and Caucasian) of 4 (girl, boy, woman, man) sets of figure picture cards with each set containing 5 cards (see Appendix 6 for full sets) were constructed in PaintShop Pro, photo editing software by Corel. Free images for each set were downloaded and manipulated. Each of the 5 cards showed a figure that was identical in height, but varied in body composition from the others by muscularity and adiposity and comprised of a lean/underweight,

average/healthy weight, overweight/obese, muscular and hyper-muscular figure (figure 4.3). There were 2.5 mm increments between each of the 3 figures which differed in adiposity. The torso size of the 2 muscular figures was held the same as the normal weight figure for each one, but different levels of muscular definition was added. Hair style, facial features and items of clothing were identical within each set. 4 sets of cards were constructed with a Caucasian skin tone and 4 sets with a slightly darker skin tone more representative of the Pakistani children.



1 2 3 4 5

Figure 4.3 - Boy with darker skin tone set of picture cards

4.2.2.1. Scoring

Each figure was numbered 1-5 on the reverse. The numbers 1-2 represented the hyper-muscular to athletic muscular figures. Numbers 3-5 represented change in adiposity from an underweight figure to an overweight/obese figure. The satisfaction score was calculated by taking the perceived current body part number from the perceived ideal body part number and the direction of dissatisfaction was also calculated (as described for study 1). The scores ranged from 0 (satisfied) to 4 (very dissatisfied).

4.2.3. Materials for study 4

A Body Parts Satisfaction Jigsaw was constructed for males using the Sims 4 (Electronic Arts, 2014) free download which included body morphing software. It comprised of 7 torsos, 7 pairs of legs, and 7 pairs of arms, which varied in

muscularity from no muscles to hyper-muscular, or varied in adiposity from underweight to obese. 7 pieces were chosen rather than the 9 from study 1 to increase simplicity of the task, but offer greater choice than the 5 body choices from studies 3 and 4. This meant a thin and muscular choice of figure could be included in the array (see figure 4.4), which was not offered in the other studies, but was deemed appropriate following comments from some of the boys who said they wanted a thin *and* muscular figure. Each figure was cut into 3 pieces to make the Body Parts Satisfaction Jigsaw (figure 4.5) and laminated (as study 1).

1 2 3 4 5 6 7

Figure 4.4 - Boy figures varying in muscularity and adiposity

Figure 4.5 - An example of the body jigsaw pieces and jigsaw pieces fitted together for study 4

4.2.3.1. Scoring

Each body part (arms, legs and torso) was given a number 1-7 on the reverse. The numbers 1-3 represented the muscular figures: hyper-muscular, athletic muscular and lean muscular. Numbers 4-9 represented change in adiposity from an underweight figure to an obese figure. The jigsaw pieces were used for the children to construct their actual and ideal body size and shape. For the child's perceived current body size and the perceived ideal body size, the numbers for the 3 body parts chosen were written down separately and the direction of dissatisfaction calculated (as study 1). The scores ranged from 0 (satisfied) to 6 (very dissatisfied).

4.2.3.2. Future adult figure

A male adult figure array was also made in the same way as the child figures. Each whole figure was cut out of the array and placed onto a single card that was laminated. Figures were numbered and scored as below (see figure 4.6).

1 2 3 4 5 6 7

Figure 4.6 - Adult figure array

4.3. Procedure

A common procedure for some tasks was employed in each study, as described below. Any differences in procedure are detailed within each chapter. All studies had a cross-sectional design.

Research area: A quiet side room/shared space close to or within the child's classroom. Younger children (aged 4-5 years old) were tested in a quiet corner of their classroom). Task materials were hidden from view and a voice recorder was placed on the table.

4.3.1. Height and weight measures

4.3.1.1. Measures for studies 1-3

Children's height (in centimetres) was measured with an altimeter and weight (in kilograms) with electronic weighing scales (with shoes off) before the task. Previous studies required children to take their shoes off, but remain fully clothed (Thomas et al, 2000). Body Mass Index (BMI) is a measure of body size calculated from an individual's weight and height and is used as a proxy measure to assess body fat and health risk (Pietrobelli et al, 1998). BMI was calculated using the formula weight (kg)/height(m)^2 and converted to BMI percentiles using the UK-WHO growth charts for girls and boys (RCPCH, 2013). As children's BMI values change as they mature, they vary across gender and age and so gender specific BMI percentiles were used to classify children into groups (National Obesity Observatory, 2011). Parents were told they could request their child's BMI by emailing the researcher. From each study, between 31% and 34% of parents requested information about their child's BMI, and were informed of their child's BMI percentile and weight status according to the classification of BMI into categories (underweight, healthy weight, overweight, very overweight).

4.3.1.2. BMI categorisation

Children were grouped using the UK1990 population cut points (Freeman et al, 1995), recommended as the most valid chart for British children (Wright et al, 2002), into underweight: ≤2nd percentile; healthy weight: >2 - <85th percentile; overweight or obese: ≥ 85th percentile-100th percentile. (Note overweight is 85th-<95 percentile and obese 95-100thpercentile, but these groups were combined for the analysis).

Although BMI was used in the first 3 studies, it should be noted the use of BMI as a proxy measure of body fat is flawed and does not account for muscle mass (Rothman, 2008; van den Berg, 2012), as it only measures body weight relative to height, so some children categorised as having an overweight BMI may have actually been heavier due to muscle mass rather than adiposity. Furthermore, BMI standards vary by age and gender and so BMI in preschoolers may not carry the same meaning that it does in adults (Smolak, 2004). Research has produced mixed findings on the relationship between muscularity, weight and Body Mass Index (BMI) in preadolescent children (see chapter 2, section 2.3.3). As analyses including BMI in studies 1-3 showed no significant effect of BMI, the body composition scales were used for study 4 to allow adiposity and muscularity to be assessed separately to ensure more accurate categorisation of children.

Furthermore, BMI is used to calculate risk of disease. However, it relates differently to various ethnic groups and as the original cut off points for what is classed as obese or overweight were derived from Caucasian populations they may not be relevant for all populations. Research reveals variation in fat distribution between different ethnic groups, with abdominal fat associated with higher disease risks (Liu et al, 2011; Ujcic-Vourtman et al, 2011). BMI is not as an effective measure of abdominal fat as waist circumference is (Ketel et al, 2007) for example, and so alternative measures to BMI with population specific cut off points need to be considered when assessing health risk due to obesity (Liu et al, 2011).

4.3.1.3. Body composition measures for study 4

Children took their shoes and socks off and their height (in centimetres) was measured with an altimeter and their body composition with the Tanita body composition scales. Tanita scales work by using Bioelectric Impedance Analysis (BIA) technology sending a very low, safe electrical signal through the body. The electrical signal passes quickly through water that is present in hydrated muscle tissue, but meets resistance when it hits the fat tissue and so through this impedance, body composition is measured. A measurement of the child's

body composition (including body fat and muscle mass) was recorded before the task.

4.3.1.4. Body fat categorisation

For the analysis in study 4, boys aged between 4 to 11 years old were categorised using the body fat ranges for boys (see Jebb et al, 2004 for the ranges for each age). For example, at age 5 boys had *low body fat under the desirable range* if they were underweight/underfat with <12% body fat; *body fat within the desirable range* if they were normal/healthy weight with 12-19%; *body fat higher than the desirable range* if they were overweight/overfat >19-23% or obese with <23% body fat.

4.3.2. Familiarisation tasks

4.3.2.1. Familiarisation task with the body satisfaction jigsaw for studies 1 and 4

Children were familiarised with the task by being asked to fit together the puppet jigsaw (Appendix 7) comprising of torso, arm, leg and head pieces following a demonstration by the researcher. The puppet had non-human body parts to limit the influence the familiarisation task could have on children's choices in the experimental condition. They were told they would be making their own body with jigsaw pieces. Children were then presented with a range of jigsaw pieces comprising of torsos, arms and legs arranged into three groups (by body part) and told, 'Here is the group of arm pieces' and so on for each group. The word 'body' was used alongside 'torso' for the younger children. The jigsaw pieces were spread out on the table and children were asked to pick up and look at the pieces. The researcher pointed to four of the pieces (order counterbalanced) and said, 'This piece has muscles, can you see where the muscles are?', 'This piece does not have muscles that you can see', 'This piece has body fat, can you see where the fatter parts are?' 'This piece does not have body fat that you can see' (see figure 4.2).

4.3.2.2. Familiarisation task with the figure cards for studies 2 and 3

The researcher pointed to four of the figure picture cards (order counterbalanced) and said, 'This picture has muscles, can you see where the muscles are?' The task was repeated as the familiarisation task above with the word *piece* replaced by *picture* (see figure 4.3).

4.3.3. Current and ideal figure tasks

4.3.3.1. Current and ideal figure jigsaw task for studies 1 and 4

The task consisted of two counterbalanced conditions, the perceived 'current' and perceived 'ideal' body size. The jigsaw pieces were stacked randomly in their body part group on the table. In the perceived *current* body size condition children were asked, 'Can you build a jigsaw of what you think you look like?' Starting with the torso group, the jigsaw pieces were randomly arranged by size on the table. Children were told, 'Choose a torso/body you think looks the most like yours'. This was repeated for the arms then the legs body pieces and the child fitted them together after each selection was made. They were instructed to draw their own head on the shaped paper and add the head to their body jigsaw. This enabled the child to create a more personalised image they could identify with to overcome the difficulties of thinking of the figure as a representation of self (see Hayes & Tantleff- Dunn, 2010). They were asked, 'Are you happy with the pieces you have chosen?' If a child answered 'no' they were told they could change any of the pieces if they wanted to and were given time to do this. Choices were recorded. Body parts were retrieved and placed back into their groups and then all pieces shuffled around within each group (so the child could not easily pick out the piece selected previously).

The process was repeated for the second condition. In the perceived *ideal* body size condition children were asked 'Can you build a jigsaw of what you would like to look like?' Children were instructed, 'You can use the same pieces again or different ones, it's up to you'. Children were not helped to select the same pieces if they wished to use them. Children were told, 'Choose a torso/body you think looks the most like how you would like to look' and were prompted to choose a torso as needed. The process was repeated as the first condition and

the child was asked to place the head they had used in the first condition onto their body jigsaw.

4.3.3.2. Current and ideal figure tasks for studies 2 and 3

Children were presented with the appropriate set of cards (matched to the child by gender and ethnicity) randomly arranged on the table and were instructed to pick out one card at a time in response to the questions. For the perceived *current* body size task children were asked, 'Which picture looks the most like you?' They were prompted to choose a card as required. They were asked, 'Are you happy with the picture you have chosen?' If a child answered 'no' they were told they could change the card if they wanted to and were given time to do this. Choices were recorded. The cards were retrieved, shuffled and randomly arranged on the table so the child could not readily identify the figure chosen previously and aid the same figure choice again (Gardner et al, 1996; 1998a). For the perceived *ideal* body size task children were asked, 'Which picture would you most like to look like?' and the process was repeated as the first condition.

4.3.4. Recording responses

Throughout all of the studies children's choices and verbal responses, if they were made, were written onto a record sheet specific to each study. A voice recorder was also used to unobtrusively record any children's verbal responses produced, although children were not required to respond verbally. Voice recordings were taken as a back up to the record sheet and to provide insight into children's choices and understanding of the task. All recordings were deleted within one month of the study.

Chapter 5

Putting the pieces together: The role of muscularity and adiposity in the development of body dissatisfaction in children:

5.1. Introduction

Negative body image is a serious issue and children in Western societies seem to develop body image concerns at a young age, demonstrating a preference for thinner bodies and reporting body dissatisfaction in early preadolescence (Davison et al, 2000; Schur et al, 2000; Berger et al, 2005; Ricciardelli et al, 2006; McCabe et al, 2007; Harriger et al, 2010, see further discussion in chapters 1 and 2). Internalisation of a thin ideal is evident in both boys and girls at around 3 to 5 years of age with children showing aversion to overweight, obese, or even average sized figures at this age (Brylinsky & Moore, 1994; Cramer & Steinwert, 1998; Musher-Eisenman et al, 2003; Harriger et al, 2010; Spiel et al, 2012). Negative body image can lead to negative behaviours and cognitions, for example some preadolescent children eat less to lose weight (Berger et al, 2005), or exercise with the intention of developing a more muscular physique (Holt & Ricciardelli, 2002), and it can also affect emotional wellbeing (see Mcreary & Sasse, 2000; Stice & Shaw, 2003; Willows et al, 2013).

The general consensus is that girls demonstrate more dissatisfaction with their bodies than boys do (see Robinson et al, 2001; Williamson & Delin, 2001; Rinderknecht & Smith, 2002; McCabe & Ricciardelli, 2004), and the pattern of body image concerns differ by gender. For example, girls mainly show concerns around weight loss and wanting a thinner figure (Markovic et al, 1998; Schur et al, 2000; Truby & Paxton, 2002; Dion, 2016), whereas boys' concerns are split between desiring either a thinner figure, larger figure or, where research has included questions about muscularity, a more muscular physique (Schur et al, 2000; Smolak, 2002; Ricciardelli et al, 2006; McCabe et al, 2007; Dion, 2016). When girls are included in research asking about muscularity, some girls do express a desire for a more muscular physique (Ricciardelli et al, 2003; McCabe et al, 2006).

Research has uncovered many factors associated with body dissatisfaction, with gender, age, and BMI as the main factors with children (Thelen et al, 1992; Flannery-Schroeder & Chrisler, 1996; Gardner et al, 1997; Ricciardelli & McCabe, 2001. See chapter 2 for a full discussion). Briefly, BMI is strongly associated with body dissatisfaction and children who are overweight or obese show the highest levels of body dissatisfaction (McCabe et al, 2006; Clark & Tiggemann, 2006; Goldfield et al, 2010; Pallan et al, 2011; Xanthopoulos et al, 2011; Olive et al, 2012; Olvera et al, 2014; Dion, 2016). For underweight children, research is limited due to low participant numbers (McCabe et al, 2005), but it generally shows underweight boys desire to be heavier (Rolland et al, 1996; Dion et al, 2016). However, the picture is less clear for girls. Some research indicates that underweight girls want to be thinner (Hill et al, 1994; Rolland et al, 1997; Dion et al, 2016) and others heavier (Ricciardelli & McCabe, 2001; Rolland et al, 1996). Furthermore, BMI may not be a factor in the desire for muscularity in boys (Holt & Ricciardelli, 2002; McCreary et al, 2006; Ricciardelli et al, 2006). Although in contrast, some studies suggest it is, for example, in McCabe et al's (2005) study, boys with lower BMI were the most focused on increasing their muscularity. Therefore, the relationship between BMI, body dissatisfaction, and muscularity warrants further investigation.

Research employing quantitative methods shows body dissatisfaction develops in preadolescence for some boys and girls (for example see Davison et al, 2000; Robinson et al, 2001; McCabe et al, 2007) and as early as 5 or 6 years old for some girls (Flannery-Schroeder & Chrisler, 1996; Davison et al, 2000; Lowes & Tiggemann, 2003) and around 6 to 8 years of age for some boys (Flannery-Schroeder & Chrisler, 1996; Robinson et al, 2001; McCabe & Ricciardelli, 2004). Negative body perceptions for both genders have been shown to steadily increase up to adolescence (Folk et al, 1993; Gardner et al, 1997; Rolland et al, 1997; Ricciardelli & McCabe, 2001; Kostanski et al, 2004; Clay et al, 2005; Li et al, 2005; Eisenberg et al, 2006; Veldhuis et al, 2012) although this is not always the case for boys (Thelen et al, 1992; Lawrence & Thelen, 1995; Ricciardelli et al, 2006). More research around exploring the effect of age on body dissatisfaction is required.

There is a need to examine the suitability of the measures used in research investigating children's body satisfaction (see chapter 2 for a review). Traditional methods of measuring body size satisfaction in children, such as figure scales, do not incorporate muscularity, assess individual body parts or always indicate the direction of dissatisfaction. Research using figure scales typically show that almost half of 7 to 13 year old girls choose a thinner 'ideal' figure than their 'current' figure, which indicates body dissatisfaction (for example, see Gardner, 2002). However, the pattern is less clear for boys. Some studies using the figure scale measure found no discrepancy between the current and ideal figures picked, which seemed to indicate that boys were not dissatisfied with their bodies at all (see Gardner et al, 1997; Williamson & Delin, 2001; Lowes & Tiggemann, 2003). However, this was not the case as the problem lies in how the numbers are reported from the measure. Research indicates there are two pathways to dissatisfaction for males (Jones & Crawford, 2005; Ridgeway & Tylka, 2005; Tiggemann, et al, 2007), and so some boys select heavier and some thinner ideal figures (for example see Schur et al, 2000). When equal numbers of boys select heavier or thinner figures and the scores are added together, the numbers cancel each other out making it appear that boys are not dissatisfied with their bodies when they are (Jacobi & Cash, 1994; McCabe & Ricciardelli, 2004). To overcome this, the direction of dissatisfaction should be reported (Dion et al, 2016).

Furthermore, the scales do not include muscularity alongside adiposity in the scale and so a desire for muscularity cannot be accurately conveyed. In studies where boys or girls pick a heavier overweight or obese figure as an ideal from the array (for example, see Brann, 2010; Collins, 1991), it is not clear whether the child's desire for a heavier figure is actually a desire for higher adiposity, or muscularity. Moreover the figure scales measure satisfaction with the whole body and do not allow satisfaction with individual body parts to be expressed. Research does show that children and adolescents demonstrate different levels of satisfaction with different parts of their bodies (Davies & Furnham, 1986; Rauste-von Wright, 1988; Gila et al, 2005). Asking children to choose a whole figure may mean they compromise their choice and choose a figure that

represents their dissatisfaction for just one body part. This could lead to loss of information and misleading results (Rosenblum & Lewis, 1999). (See chapter 2 for further discussion of these points).

Questionnaire methods are usually used to explore concerns around muscularity with children and responses do indicate that muscularity seems to be important to 8 to 9 year old boys (McCabe et al, 2005), with a desire for muscularity emerging between the ages of 8 to 10 years old (McCabe et al, 2006). Unfortunately this research does not study children under the age of 8, due to the cognitive limitations of younger children, making the questionnaire method inappropriate to use with younger age groups and so it is not understood whether younger children also desire a muscular figure. Qualitative research suggests that boys as young as 4 have spoken to their mothers about wanting to increase their muscularity (McCabe et al, 2007). Therefore there is a need to use an appropriate measure to explore the desire for muscularity in younger children.

The aims of of this study were to address some of the current limitations of visual scales assessing body satisfaction in young children and to investigate the role of different factors on children's body dissatisfaction. An innovative method was developed specifically for use with boys and girls from 4 years to 11 years of age. The Body Parts Satisfaction Jigsaw was created to: assess satisfaction of 3 individual body parts; include both adiposity and muscularity; and allow for calculation of the direction of dissatisfaction.

5.2. Method

Detailed explanation of the general methodology, materials and procedure can be found in chapter 4.

5.2.1. Participants

Participants were 176 children (equal numbers of boys and girls), in 4 age categories: 4-5 years (M = 63.6, SD = 3.5), 6-7 years (M = 79.6 months, SD =6.7), 8-9 years (M = 104.6 months, SD = 6.4), 10-11 years, (M = 132.0

months, SD = 6.9). Using GPower software it was calculated that a sample size of 176 (22 boys and 22 girls in each age category) was sufficient for a 2x2x3x4 mixed measures design. Children were recruited from a primary school in the UK and were predominantly middle class and White British: (88.1% White British, 2.3% Pakistani, 1.7 % Indian, 0.6% Chinese, 0.6% White & Black Caribbean, 0.6% White and Asian, 6.3% Other).

BMI centiles ranged from 1-99 (M = 55, SD = 28.2) and children were grouped into underweight: ≤2nd centile (n = 3), Healthy weight: >2 - <85th centile (n = 141), Overweight or obese: ≥ 85th centile-100th centile (n = 32) for the analysis.

5.2.2. Materials

A Body Parts Satisfaction Jigsaw comprising of 9 torsos, 9 pairs of arms, and 9 pairs of leg pieces which varied in muscularity from no muscles to hyper-muscular, or differed in adiposity from underweight to obese was used (see figures 4.1 and 4.2).

5.2.3. Procedure

Children were taken to the test area and before the task, height (in centimetres) was measured with an altimeter and weight (in kilograms) with electronic weighing scales (with shoes off). Children's Body Mass Index (BMI) was calculated.

Children were seated at the table in the test area and familiarised with the task by being asked to fit together the puppet jigsaw (Appendix 7) comprising of torso, arm, leg and head pieces following a demonstration by the researcher. The researcher presented children with the Body Satisfaction Jigsaw pieces, pointed at a selection of them and described them, for example telling the child, 'This piece has muscles, can you see where the muscles are?'

The task consisted of two counterbalanced conditions, the perceived 'current' and perceived 'ideal' body size. In the perceived *current* body size condition

children were asked, ‘Can you build a jigsaw of what you think you look like?’ Starting with the torso group, children were told, ‘Choose a torso/body you think looks the most like yours’. This was repeated for the arms then the legs body pieces and the child fitted them together after each selection was made. They were instructed to draw their own head on the shaped paper and add the head to their body jigsaw. Choices were recorded. In the perceived *ideal* body size condition children were asked ‘Can you build a jigsaw of what you would like to look like?’ The process was repeated as the first condition and the child was asked to place the head they had used in the first condition onto their body jigsaw.

5.2.4. Statistical analyses

Body satisfaction was calculated (see chapter 4).

Raw data were entered into an IBM SPSS Statistics package. *Body satisfaction* was analysed with a 2(gender: male x female) by 2(body: current x ideal) by 3(body part: torso x pair of arms x pair of legs) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) mixed design multivariate analysis of variance or covariance (MANCOVA) with repeated measures on the body choice factor and BMI centile as a covariate.

To measure the effects of the *factors: age, gender and BMI* on body image satisfaction, the perceived-ideal discrepancy scores for the torso, arms and legs were the dependent variables in the MANCOVA, with age and gender as fixed factors and BMI centile as a covariate. BMI category was also used in the analysis and entered into a MANOVA as a fixed factor (with age and gender) and not as BMI centile. Further post hoc analyses were carried out as necessary.

Direction of dissatisfaction was analysed with a 2(gender: male x female) by 2(body choice: current x ideal body) by 3(body part: torso x pair of arms x pair of legs) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by

4(perceived body size: muscular, lean, normal weight, overweight/obese) MANCOVA with repeated measures on the body choice factor and BMI as a covariate. BMI category and not BMI centile was also entered into a MANOVA. Further post hoc analyses were carried out as necessary.

A one-way analysis of variance (ANOVA) was used to investigate the effects of gender on the direction scores for the body parts torso, arms and legs. An ANOVA was also used to examine the effect on the dissatisfaction direction score of the body part chosen and perceived current body size (grouped into: muscular, lean, normal weight, overweight or obese) and gender. Further post hoc analyses were carried out as required.

5.3. Results

5.3.1. Body satisfaction

To determine the child's satisfaction with their 3 body parts, the discrepancy score for each of the body parts was calculated by subtracting the number of the child's perceived current body size from their ideal body size. The mean discrepancy scores (see table 5.1) indicated that all groups of children were dissatisfied with their torsos, arms and legs.

A MANCOVA was performed using the three dependent variables, the torso, arms and legs discrepancy scores, to investigate if there were any interactions between gender, age and BMI centile. Analysis showed children's satisfaction with their 3 body parts varied by gender and age. Using gender and age as fixed factors and BMI centile as a covariate with the use of Pillai's criterion, there was a significant multivariate effect for Gender, $F(3, 165) = 10.97$, $p < .001$ and Age $F(9, 501) = 2.61$, $p < .01$, but not BMI ($p > .05$). For gender, univariate tests indicated that boys scored significantly higher than girls on the discrepancy scores for their torso $F(1, 167) = 67.61$, $p < .001$, arms $F(1, 167) = 30.34$, $p < .001$ and legs $F(1, 167) = 26.28$, $p < .001$. A higher percentage of boys than girls were dissatisfied with their torso, arms and legs (see table 5.1) and boys had a higher mean discrepancy score for each of their 3 body parts.

Table 5.1 - Body part discrepancy scores and percentage body dissatisfaction by gender and age group

			Body part discrepancy scores for boys			Body part discrepancy scores for girls		
			Torso	Arms	Legs	Torso	Arms	Legs
		N	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Age group	4-5	22	3.32 (2.21)	2.36 (2.24)	2.64 (2.15)	2.00 (1.93)	2.05 (1.86)	1.91 (1.85)
	6-7	22	1.95 (1.79)	2.64 (2.08)	1.64 (1.76)	1.23 (1.27)	1.41 (1.37)	0.95 (0.90)
	8-9	22	2.41 (1.99)	2.05 (1.62)	1.86 (1.58)	1.27 (0.94)	1.23 (1.19)	1.05 (1.13)
	10-11	22	2.55 (1.54)	2.00 (1.41)	1.86 (1.64)	0.77 (0.97)	1.05 (1.25)	1.00 (1.070)
	Total score	88	2.56 (1.93)	2.26 (1.85)	2.00 (1.81)	1.32 (1.39)	1.43 (1.47)	1.23 (1.33)
% dissatisfaction N = 88			85.23 (n = 75)	84.09 (n = 74)	77.27 (n = 68)	69.32 (n = 61)	70.45 (n = 62)	65.91 (n = 58)

This indicated that the boys demonstrated higher body dissatisfaction than the girls.

Univariate tests showed the interaction with age did not apply to all age groups or all body parts. The body part discrepancy score differed significantly for age, for Torso $F(3, 167) = 4.30$, $p < .01$ and Legs $F(3, 167) = 3.53$, $p < .01$, but not arms ($P > .05$). It was the 4-5 year old age group who showed significantly greater dissatisfaction with their torso than both the 6-7 year old age group $p < .05$ and the 10-11 year old age group $p < .05$, and significantly greater dissatisfaction with their legs than the 6-7 year old age group $p < .05$.

5.3.2. Direction of dissatisfaction

The direction of the dissatisfaction and what this indicated in terms of a child's desire for muscularity and, or adiposity was analysed. Depending upon the current body size selected and the magnitude of the discrepancy score, a negative direction score indicated the dissatisfaction in the direction of wanting to be leaner and, or more muscular. A positive direction score indicated the child wanted to be less muscular and, or have more body fat. This was calculated for each of the three body parts. The total mean direction scores (see Total rows, table 5.2) were negative and indicated the children wanted to be leaner or more muscular.

However, there was a significant gender difference in this choice for each body part chosen. An ANOVA showed a significant difference between the direction scores for boys and girls for torso $F(1,174) = 32.96$, $p < .001$, arms $F(1\text{-}174) = 37.0$, $p < .01$ and legs $F(1\text{-}174) = 3.99$, $p < .05$. Different ideal body choices were made by boys and girls (see figure 5.1, page 78). For each body part, boys selected a more muscular figure whereas girls chose a leaner physique. 78.4% of boys chose a muscular torso, 71.6% muscular arms and 72.7% muscular legs as an ideal body part, compared to 55.7% of girls who chose a lean torso, 63.6% lean arms and 68.2% lean legs.

Table 5.2 - Descriptive statistics for direction scores for each perceived current body type

		Torso	**Arms**	**Legs**
Gender	**Current body type**	**Mean direction score (SD)**	**Mean direction score (SD)**	**Mean direction score (SD)**
Boys	Muscular	-1.10 (1.86)	-0.95 (1.91)	0.11 (2.34)
	Lean	-2.55 (2.13)	-1.09 (2.84)	-1.85 (2.12)
	Normal weight	-3.56 (2.26)	-2.10 (2.73)	-3.14 (2.12)
	Overweight/obese	-4.50 (2.59)	-4.00 (3.27)	-3.00 (4.24)
	Total	**-2.19 (2.34)**	**-1.38 (2.59)**	**-0.95 (2.53)**
Girls	Muscular	1.67 (1.83)	1.50 (1.86)	1.40 (1.70)
	Lean	-0.36 (1.78)	-0.21 (1.40)	-0.37 (1.25)
	Normal weight	-0.96 (0.92)	-1.95 (1.43)	-1.50 (1.05)
	Overweight/obese	-3.33 (3.22)	-3.67 (3.22)	-3.50 (4.95)
	Total	**-0.36 (1.88)**	**-0.45 (2.05)**	**-0.30 (1.79)**
Boys and Girls	Muscular	-0.48 (2.17)	-0.24 (2.19)	0.50 (2.23)
	Lean	-1.06 (2.14)	-0.57 (2.13)	-0.99 (1.81)
	Normal weight	-2.02 (2.04)	-2.00 (1.88)	-1.93 (1.54)
	Overweight/obese	-4.11 (2.67)	-3.90 (3.07)	-3.25 (3.78)
	Total	**-1.28 (2.31)**	**-0.91 (2.36)**	**-0.63 (2.21)**

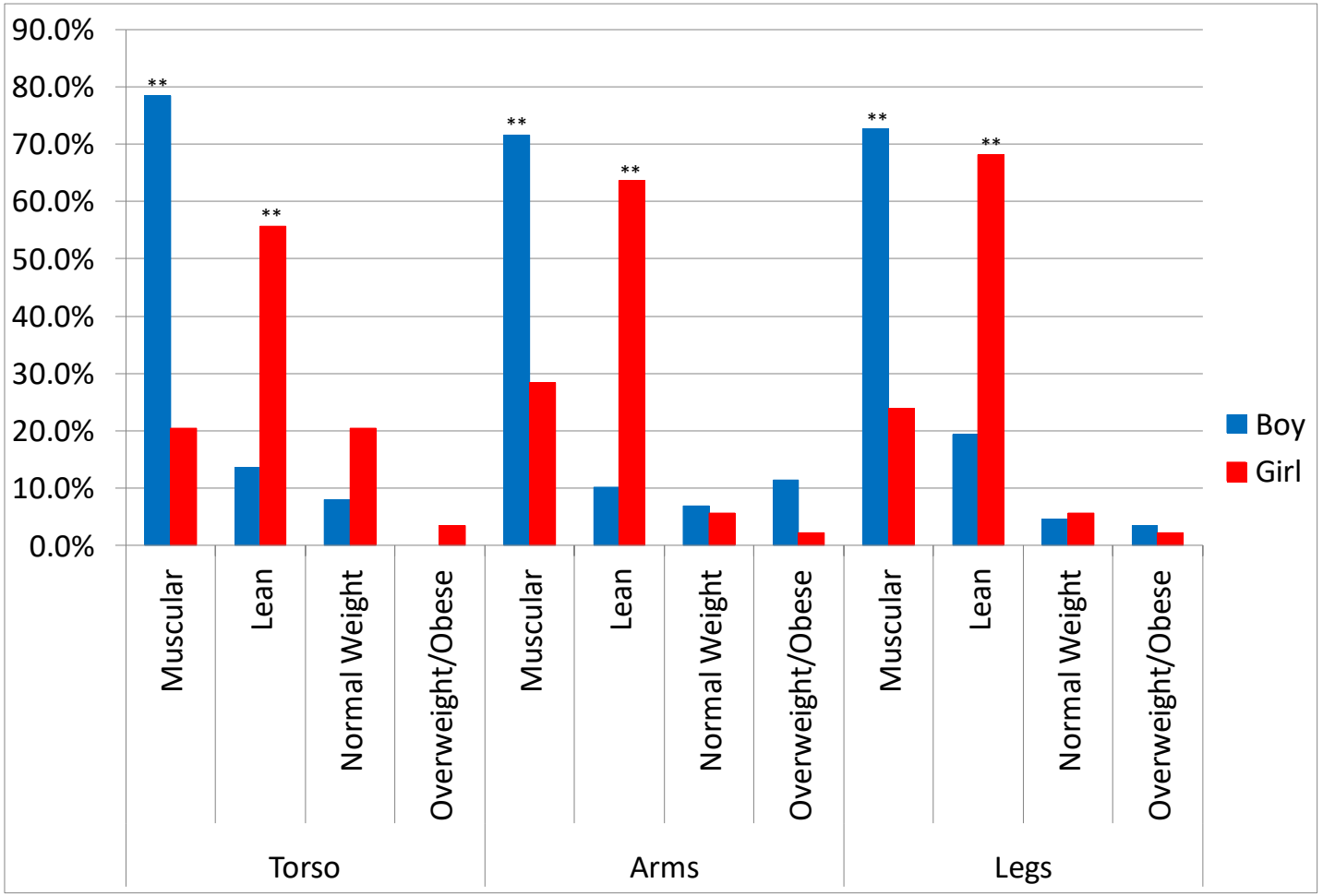


Figure 5.1 - Percentage of children choosing each figure type as their ideal body part for torso, arms and legs. ** $p<0.01$

There was also a significant gender difference in direction scores depending upon the body part and the child's perceived current body size for that body part. This was significant for the torso body part with the muscular, $F(1,52) = 20.77$, $p < .001$, lean $F(1,67) = 19.93$, $p < .001$ and normal weight current body size groups, $F(1,42) = 27.99$, $p < .001$, but not the overweight and obese group >.05. Looking at the direction and size of the direction score (table 5.2), boys within all 4 current body size groups desired a more muscular torso. This is not the same for girls (see table 5.2). Girls perceiving their torso as muscular wanted to be less muscular. Normal weight girls wanted to have a leaner torso. Lean and overweight or obese girls wanted to be leaner and or have slightly defined muscle.

The pattern of gender differences for the legs body part was similar to the torso body part. For the legs there was a significant gender difference between the direction scores for muscular, $F(1,64) = 4.94$, $p < .05$, lean $F(1,77) = 15.06$, $p < .001$ and normal weight groups, $F(1,25) = 7.31$, $p < .05$, but not the overweight and obese group >.05. Looking at the direction and size of the direction score for legs (see table 5.2), the pattern followed the one described for the torso for the girls. For boys, lean and normal weight groups wanted more muscular legs, as they did for torso. However, boys who already had muscular legs wanted slightly less muscular legs and those with overweight or obese legs wanted to have leaner legs.

For the arms body part the pattern of gender differences in direction scores were different to the torso and legs, where there was a significant gender difference between the direction scores for the muscular group, $F(1,53) = 18.99$, $p < .001$, but not the lean, normal weight or overweight and obese groups >.05. However, the pattern of direction for boys and girls was the same as for the torso body part (see table 5.2): boys in all 4 current body types wanted to be more muscular; girls perceiving their arms as muscular wanted to be less muscular, normal weight girls wanted leaner arms; lean and overweight or obese girls wanted leaner arms and, or to have slightly defined muscle.

The children who perceived themselves to be in the *overweight or obese* group for the 3 body parts had the largest direction score than the other groups in the direction of wanting to be leaner and, or more muscular for their torso $F(3,172) = 9.66$, $p < .001$, arms $F(3,172) = 11.46$, $p < .001$ and legs $F(3,172) = 13.97$, $p < .001$. This indicated this group felt the most dissatisfaction with their bodies and this was true for both boys and girls (see table 5.2).

For the torso and arms body parts the Bonferroni *post hoc* test showed a significant difference in direction scores between the overweight and obese group and all other groups and the normal weight group and all other groups, but not between the muscular and lean group. For legs, the significant difference in direction score was between the muscular group and all other groups and the lean group and all other groups, but not between the normal and overweight or obese groups. Interestingly, girls with muscular legs desired them to be less muscular and boys with muscular legs wanted them to remain the same, or be slightly less muscular. Boys with lean legs desired more muscle and girls with lean legs wanted them slightly leaner and, or slightly more muscular.

5.3.3. Dissatisfaction over the 3 body parts

A MANOVA (reporting Pillai's trace) showed that the dissatisfaction direction scores varied significantly between the three body parts for the boys, $F(3, 85) = 29.99$, $p < .001$, but not for girls ($p > 0.05$). For boys the difference score differed significantly between the torso $F(1, 87) = 77.41$, $p < .001$ arms $F(1, 87) = 24.84$, $p < .001$ and legs $F(1, 87) = 12.55$, $p < .01$. This score indicated the amount and direction of dissatisfaction with the body and suggested girls' showed a similar amount of dissatisfaction in a similar direction over the three body parts. Whereas the boys dissatisfaction varied; boys' dissatisfaction score was higher for the torso, then arms, then legs (see table 5.2 for mean direction scores per body part).

5.3.4. BMI

There was no significant effect of BMI centile or BMI category on the children's ideal body part selected ($p > .05$) or on the discrepancy (satisfaction) score for each body part ($p > .05$) or direction score for each body part ($p > .05$).

5.4. Discussion

Key findings:

- Boys demonstrated higher body dissatisfaction than girls.
- There were significant gender differences in body satisfaction.
- Stereotypical idealised body perception is seen in young children where boys wanted to be muscular and girls wanted to be lean.
- Girls were equally dissatisfied with each of their body parts, whereas boys' dissatisfaction varied across the body parts.
- Children who perceived themselves as overweight or obese were the most dissatisfied with their body parts.

The objectives of this study were to address current limitations of visual body size satisfaction measures with children by developing a scale to be used with 4-11 year olds that included both adiposity and muscularity and could assess the direction of dissatisfaction over three different body parts (torso, arms and legs). The novel Body Parts Satisfaction Jigsaw developed revealed significant gender differences in the pattern of body image dissatisfaction for boys and girls. Firstly, boys were much more dissatisfied with their bodies than girls, which contrasted with previous research where girls are typically shown to be more dissatisfied than boys (see Robinson et al, 2001; Williamson & Delin, 2001; Rinderknecht & Smith, 2002; McCabe & Ricciardelli, 2004). Previous research does not include muscularity in the measure and so it is proposed that by including this dimension in the innovative measure, boys were able to express their desire for muscularity and so demonstrated dissatisfaction with their bodies that they do not usually express with a measure that assesses adiposity alone.

Furthermore, incorporating muscularity into the measure showed that not only did 71.6%-78.4% of the boys desire a muscular physique, but 20.5%-28.4% of the girls also desired a muscular torso, arms and legs, and thus supported research which reported that some girls were concerned with muscularity (see Ricciardelli et al, 2003; McCabe et al, 2005; 2006). Girls therefore should be included in body image research exploring muscularity concerns (McCreary, 2011). Some boys also desired the lean body parts in this study, confirming there are two different pathways towards body dissatisfaction for boys (see Jones & Crawford, 2005). Boys do choose a leaner figure, but less so than girls (see Collins, 1991; Schur et al, 2000; Smolak, 2002) as found in the current study.

Stereotypical idealised body perception was seen in the preadolescent children where the direction of body dissatisfaction was in desiring leaner and muscular body parts, consequently reflecting the Western ideals around the body sizes desirable for males and females (see Grogan & Richards, 2002; Tiggeman, 2011a). Moreover most boys desired a more muscular physique than their own, (as found by Ricciardelli et al, 2006; McCabe et al, 2007) and so seemed to be conforming to the ideal male stereotype of a toned muscular V-shaped body type and defined ‘six-pack’ abdominal muscles (Grogan & Richards, 2002; Labre, 2005; Thompson & Cafri, 2007; Tiggeman, 2011a). Over half of the girls desired a leaner physique (as supported by Markovic et al, 1998; Gardner et al, 1999a; Davison et al, 2000; Schur et al, 2000; Truby & Paxton, 2002; McCabe et al, 2007), and almost a quarter, a muscular physique, thus demonstrating an awareness that an ideal female is very thin (Thompson et al, 1999) and physically fit (Forbes, et al, 2004; Tiggeman, 2011a). It seemed that girls and boys had internalised the stereotypical ideals for each gender and were aware from a young age, some as young as 4 years old, of the physical characteristics that are socially valued for males and females (Tiggemann, 2012), and of the pressure to conform to two distinct body shapes, thin for girls and mesomorphic for boys (Barlett et al, 2008).

Use of the measure also revealed that the pattern of dissatisfaction over the 3 body parts differed for boys and girls. Girls were equally dissatisfied with each of their body parts, whereas boys' dissatisfaction varied across the body parts, with boys expressing the greatest dissatisfaction with their torso, then arms and the lowest dissatisfaction with their legs. For the girls, these findings contrasted with those from published research with adolescents and adults, where body dissatisfaction for the females varied between different body parts (see Davies & Furnham, 1986; Rauste-von Wright, 1988; Cash & Henry, 1995). This disparity could be due to the age of the sample in the current study, where preadolescent girls were included and it could be that the differences in satisfaction observed between particular body parts may develop during puberty for girls (as found by Davies & Furnham, 1986; Rosenblum & Lewis, 1999). For boys, the findings of the current research mirror what have been found in research with older males. Adolescents showed the greatest dissatisfaction with their shoulders (Rauste-von Wright, 1988), and body parts above the waist (abdominals and arms) and below the waist (thighs and calves) were concerns for men (Ridgeway & Tylka, 2005). Other research suggested that boys become more satisfied with individual body parts as they get older (Rosenblum & Lewis, 1999), although this trend was not seen between the age groups in the current research, again likely due to the inclusion of preadolescents only.

Body dissatisfaction did not develop at a particular age for the children in the current study, rather girls and boys across all age groups from 4 to 11 years old demonstrated dissatisfaction with their torso, arms and legs. However, the 4 to 5 year old age group were significantly more dissatisfied with their torso and legs than some older age groups. Although the researcher ensured children understood what they had to do in the task, these differences could be explained by younger children's limited understanding of the concepts involved or shorter attention span. The researcher noted that some younger children became distracted by details on the figures (as found in other research, see Hill, 2012), for example, some commented on the shoes being similar or different to their own. However, an interesting finding was the younger children picked a wider range of figures as an ideal, thus giving a larger dissatisfaction score due

to the discrepancy between the perceived and ideal body shape being larger. A possible explanation for this could be that at this age, children are less certain about the way they want to look, or will more readily pick the unrealistic figures as an ideal, without realising what is realistic and achievable as a body shape. In support of this in the current study, a young boy aged 4 years old reported that he wanted to look like 'the Hulk' and selected the extreme hypermuscular body parts he named as 'Hulky arms' and 'Hulky legs' which he placed on the hypermuscular torso for his body ideal.

BMI was not a factor affecting body satisfaction in this study, in contrast to other research (see for example, Rinderknecht & Smith, 2002; McCabe et al, 2006; Olive et al, 2012; Willows et al, 2013; Olvera et al, 2014; Dion, 2016) and the relationship between BMI and desire for muscles remains unclear. Children within all BMI groups desired muscularity, except for the five obese children, who desired the lean or normal weight physiques. This is supported by research where BMI was not a factor in the desire for muscularity (see McCabe et al, 2005; Brann, 2010). A possible limitation could be with the uneven number of children in each BMI group and the small number of children in the underweight category, as found in other research (see McCabe et al, 2005). Furthermore it should be noted the use of BMI as a proxy measure of body fat is flawed and does not account for muscle mass (Rothman, 2008; van den Berg, 2012), so some children categorised as having an overweight BMI may have actually been heavier due to muscle mass, rather than adiposity (see chapter 4 for further discussion). A consideration for future research is the use of measures such as body composition scales, which would allow adiposity and muscularity to be assessed separately, ensuring correct body categorisation.

Nevertheless, although it was found that BMI was not linked to body size satisfaction, the child's *perceived* current body size significantly influenced the level of satisfaction and the direction of dissatisfaction the child had with their body parts. Overall, it was the children who perceived their body parts to be overweight or obese (regardless of whether they actually were), who demonstrated the highest body dissatisfaction. In support of this, some studies

suggest it was the child's subjective perception of their bodies, and not their weight or BMI, that had a stronger impact on body dissatisfaction (see Davison et al, 2000; Canpolat et al, 2005; Dion et al, 2016) and weight and shape concern, rather than weight itself, can affect children's psychological well-being (Russell-Mayhew et al, 2012). These children may be the most dissatisfied with their bodies because they have internalised the societal stigma and negative stereotypes around larger body sizes and the desire for thinner bodies (Smolak, 2002; Puhl & Latner, 2007) and perceive their body parts to be overweight or obese and so the furthest away from the ideal.

For girls, not boys, their current perceived body size also affected their ideal body size choices. Generally boys desired a muscular physique for each body part regardless of their perceived current body size, whereas girls who perceived their current body size as 'normal weight' for their torso, arms or legs, desired to have leaner body parts. Girls perceiving their body parts as 'lean', or 'overweight or obese' also wanted to be leaner, or with slightly defined muscle. Interestingly girls who perceived their body parts as 'muscular' desired less muscle. Perhaps the desire for a less muscular physique reflected an awareness of a stereotype around the body sizes desirable for females (Grogan & Wainwright, 1996). It is likely the children's choices were influenced by societal ideals of body shape, where women cannot have an overly muscular physique if they are to be perceived as feminine, (see Forbes et al, 2004; Grogan et al, 2004). In support of this, the researcher noted comments children made during the task, for example some girls said they did not want 'too much muscle' and both boys and girls commented that the muscular body parts looked 'boyish'.

As discussed in chapter 4, research had revealed that some children and their parents selected a larger body shape from the obese or overweight figures as an ideal (see Truby & Paxton, 2002; Ricciardelli et al, 2003; Clark & Tiggemann, 2006; Ricciardelli et al, 2006; Duchin et al, 2015). An explanation of why the overweight or obese figures are viewed as ideals could be because these figures appear to represent bulk, which could be confused with muscularity (see

Brann, 2010; Cohane and Pope, 2001). In the current study, it was noted that a much lower percentage of children selected the overweight or obese figures as an ideal, than found in the other studies. This could be because the body satisfaction jigsaw used included muscularity into the scale and clearly separated this from adiposity, and so children could select a highly muscular figure if they wished to from the muscular options, rather than compromising by having to choose a figure of higher adiposity. This finding has given a more accurate picture of body shape ideals for children.

5.4.1. Conclusions

There has been a lack of research exploring the three aspects of adiposity, muscularity and body dissatisfaction with young and preadolescent children (aged 4 to 11 years old). The current study has extended our knowledge of these topics and developed an innovative measure for use with younger children.

A novel Body Parts Satisfaction Jigsaw was developed for use with children and the findings of this study hold implications for how body satisfaction should be assessed in children. The author believes the tactile nature of the jigsaw engaged the youngest children in the task more than traditional figure scale measures could, because children were active in handling and moving the pieces. If a figural scale is to be used with boys and girls, the suggestion is to include both adiposity and muscularity into the scale in order to reflect the desire of boys, and a large proportion of girls, to have a muscular physique. Furthermore, the suggestion is for a scale that assesses individual body parts separately, in order to fully understand the pattern of dissatisfaction in preadolescent children. The boys in the current study demonstrated different patterns of dissatisfaction with varying body parts, and so a scale that measures the whole body, rather than one that targets particular body parts, may not accurately reveal the true pattern of body dissatisfaction for boys (Rosenblum & Lewis, 1999). In addition, it should be noted that if the scores on individual body parts had been added in this study, it could have masked the presence of high levels of dissatisfaction for boys. Future researchers need to consider that

asking children to appraise the body as a whole or on a part-by-part basis may give different results because it may be measuring different aspects of body image (Ben-Tovim & Walker, 1991). Overall however, the Body Parts Satisfaction Jigsaw developed in this study shows utility in successfully measuring body dissatisfaction in children.

5.4.2. Future directions for research

This study has revealed that young children were making ideal body choices that appeared to be reflecting Western stereotypes around the body sizes desirable for males and females and so it would be beneficial to widen the scope of the study to find out whether children are aware of, or have internalized these ideals, for bodies other than their own. Areas for further study are:

- To investigate body ideals and stereotypes children may hold around body shapes in terms of muscularity and adiposity, for child and adult male and female bodies, other than their own.

- To find out the ideal body shape the child would like to have as both a child and future adult, and the body shape the child would NOT like to have as a child or future adult.

- To investigate the ideal body shape the child perceives other children will choose for their own sex, or opposite sex.

- To further explore some of the factors (age, gender, BMI, ethnicity, perceived body size) on body satisfaction, the direction of dissatisfaction and ideal body choice.

Chapter 6

Gender stereotypes around body shapes that incorporate muscularity and adiposity:

6.1. Introduction

The use of a novel Body Parts Satisfaction Jigsaw assessing both muscularity and adiposity in study 1, revealed significant gender differences in body satisfaction. Boys reported a higher body dissatisfaction than girls; more boys than girls were dissatisfied with their body parts; and boys chose muscular body parts and girls leaner parts, as an ideal. Published research suggests both girls and boys choose an ideal figure that is thinner than their perceived actual body size (see Davison et al, 2000; Truby & Paxton, 2002; Rinderknecht & Smith, 2002; Ricciardelli et al, 2006; McCabe et al, 2007) and many boys and some girls express a desire to increase their muscularity (Ricciardelli et al, 2003; McCabe et al, 2005; 2006). (See chapter 2 for a full review of the literature). The results from study 1 confirmed the development of body dissatisfaction at a young age (from 4 years old) and showed boys to be more dissatisfied than girls, in contrast to published research (see for example, Robinson et al, 2001; Williamson & Delin, 2001; McCabe & Ricciardelli, 2001; 2004; Rinderknecht & Smith, 2002; Tremblay et al, 2011). Moreover, research shows children sometimes choose a larger figure than their own as an ideal (Truby & Paxton, 2002; Musher-Eizenman et al, 2003; Clark & Tiggemann, 2006; Ricciardelli et al, 2006; Duchin et al, 2015) which could indicate the desire to have more bulk. However, fewer children chose this figure in study 1, likely due to the use of the measure which allowed children to express a desire for muscularity, rather than just adiposity.

Children's choices seem to be reflecting Western stereotypes around the body sizes desirable for males and females (see Grogan & Richards, 2002; Tiggeman, 2011a). As discussed in the review of the literature, the thin ideal stereotype is internalised by preschool aged children and illustrated through their preference for very thin bodies (Davison et al, 2000; McCabe et al, 2007)

and aversion to average sized, overweight and obese figures (Harriger et al, 2010). Children hold negative 'anti-fat' attitudes which develop during the preschool years (Musher-Eisenman et al, 2003; Spiel et al, 2012) and young children start to assign negative characteristics to larger figures as early as 3 to 5 years old (Spiel et al, 2012; Sagone & De Caroli, 2013). The evidence suggests girls as young as 8 years old fear becoming fat (Shapiro et al, 1997) and perceive being overweight as undesirable (Cramer & Steinwert, 1998; Musher-Eisenman et al, 2003). Indeed, when asked to pick attractive adult figures, children as young as 6 years old did not pick an overweight figure as an attractive female, and at 8 years old did not choose an overweight figure as an attractive male (Connolly et al, 2004).

Research indicates that children develop an awareness of gender and perceive gendered categories, relating to how males and females should look and behave, at a young age (Thompson & Bentler, 1971; Zosuls et al, 2009). Preschool children rely on superficial cues, such as hair length, to judge the sex of a figure (Thompson & Bentler, 1971), but by the age of 4 to 6 years old there is a developmental shift, where children notice and take account of anatomical sex differences. For instance, young children aged 5 to 6 years old can categorise a male or female fairly accurately from their waist-to-hip-ratio (WHR) (Johnson et al, 2010). Puberty causes a visible change in WHR and it is calculated by dividing the circumference of the waist by the circumference of the hips (Connolly et al, 2004).

Between the ages of 4 to 6 years old, children develop gender constancy where they understand the permanence of their own sex and researchers have linked this development to a growth in gender stereotype knowledge (Martin et al, 2002). A stereotype for what makes an 'ideal' male or female body, in terms of muscularity and adiposity, could therefore develop at an early age. Research in this area generally focuses on children choosing their own body ideal. However, this study aims to investigate young children's perception of the 'ideal' body shape (incorporating both muscularity and adiposity) for different groups of males and females, in order to explore whether a stereotype exists for children

around how male and female bodies should look and to give an insight into the development of body shape ideals. In studies where children have been asked about body shapes for men and women, 45% of the girls and 38% of the boys, thought it was important for women to be thin, and 35% of the girls and 33% of the boys also felt that it was important for men to be thin (Shapiro et al, 1997).

Furthermore, males and females may have a distorted view of the figure they perceive as an 'ideal' which could impact on the perception of their own body. For example, mothers, fathers and daughters all thought they were heavier than their ideal body in Rozin and Fallon's (1988) study. Some research indicates women seem to overrate others' preferences for thinner figures, despite the choice for a more rounded figure by same sex peers (Cohn & Adler, 1992; Lamb et al, 1993; Forbes et al, 2001) and by the opposite sex (Fallon & Rozin, 1985; Rozin & Fallon, 1988; Cohn & Adler, 1992). However, many recent studies show the figure men and women perceive as the most attractive for females to be similar, highlighting the awareness of the importance of thinness for the female figure (Tovée & Cornelissen 2001; Winkler & Rhodes, 2005; Benninghoven et al, 2007; Smith et al, 2007) and perhaps representing a shift in male attitudes towards greater thinness for women over time. Interestingly, when asked to pick an ideal female figure, some men and women pick one thinner than the figure they perceive to be 'normal' (Winkler & Rhodes, 2005; Glauert et al, 2009). Moreover, men appear to overestimate the muscularity for same sex peers (Cohn & Adler, 1992) and adiposity chosen by the opposite sex, with women preferring a thinner figure than men selected themselves (Fallon & Rozin, 1985). It should be noted that in most of the studies referred to above, the male and female figures presented varied in adiposity, not muscularity, so further investigation using scales incorporating both is required.

This type of research has not as often been conducted with children, but Cohn et al (1987) found 10 to 15 year old girls and boys had similar misjudgements about opposite sex preferences as found in their adult research. The boys thought the girls would pick a thinner male figure as the most attractive, than the one they actually chose as an ideal, and the girls picked a significantly thinner

female figure, than the figure they thought the boys would prefer (Cohn et al, 1987). This was supported by later research with 7 to 11 year old girls (Tiggemann & Wilson-Barrett, 1998). In a study by Brown and Slaughter (2011), 4 to 26 year olds were asked to rank sets of photographs of female bodies varying in width and results indicated that for all age groups, the figures they objectively perceived as attractive, were significantly thinner than those they rated as 'normal'. These findings suggest the thin ideal develops in young children and the preference for thinner figures extends into adulthood.

In contrast, when 6 to 17 year olds were asked to give judgements about other people's bodies (not their own), in Connolly et al's study (2004), the normal weight male body was judged the most attractive by both boys and girls by 12 years of age and the normal weight female body by 14 years of age. This preference for the normal weight figure increased with age and interestingly, it was the youngest children who chose the thinner figures as the most attractive. In the same study, a preference for higher male waist to hip ratios (WHRs) and lower female WHRs developed with age. The preference for higher male WHRs had developed by the age of 10 and lower female WHRs by 12 years old, in both boys and girls (Connolly et al, 2004). The WHRs chosen as the most attractive were akin to those chosen by adults, 0.7 for females and 0.9 for men (for example see Connolly et al, 2000).

In the current study, children were asked to select a figure they perceived a child of the opposite sex would choose as an ideal body shape for different groups of males and females. Asking children to predict the choices another person could make, required the development of theory of mind (ToM). This is the understanding of other people's minds; knowing that people can have different mental states from their own, that may contradict reality and lead to different action (Astington et al, 1988). ToM typically improves between the ages of 3 and 5 years (Jenkins & Astington, 2000). In this study's task, children needed to understand what another child might believe or think about figures of different sizes, and they were asked to predict which figure they thought another child would choose. As the youngest children in this study were 4 years old, the

researcher thoroughly checked the children's understanding of the task through questioning, which resulted in data from 5 of the children not being included, due to the researcher assessing a lack of understanding of the required ToM.

Through the use of a modified version of the scale from study 1 (see chapter 4), this study aimed to explore children's internalization of the cultural ideal body type for their sex and examine their awareness of cultural ideals, and to investigate the role of different factors on children's body dissatisfaction. Young children's perception of the 'ideal' body shape (incorporating both muscularity and adiposity) for different groups of males and females will be investigated in order to explore whether a stereotype exists for children around how male and female bodies should look. Specifically to find out:

- How body satisfaction varies by age, BMI and gender.
- How the direction of dissatisfaction varies by age, BMI, gender and perceived body size.
- The ideal body shape the child would like to have as a child or adult and how it varies by the child's gender, BMI, age and ethnicity.
- The body shape the child would NOT like to have as a child or adult and how it varies by the child's gender and age.
- The ideal body shape chosen (for a boy, girl, man, woman) and how this varies by the child's gender.
- The ideal body shape children perceived a child of the opposite sex would choose for their sex, (for instance, what will a boy choose as an 'ideal' girl body shape?).
- Whether when a child is asked to choose the ideal body shape they thought the opposite sex would choose for their sex, it matches the ideal they choose for themselves. (For example, did the figure a girl thought a boy would choose as an ideal girl, match the figure she chose for herself?).

6.2. Method

Detailed explanation of the general methodology, materials and procedure can be found in chapter 4.

6.2.1. Participants

Participants were 184 children (equal numbers of boys and girls), in four age categories: 4-5 years (M = 63.7 months, SD = 3.9), 6-7 years (M = 81.9 months, SD = 6.8), 8-9 years (M = 106.9 months, SD = 6.3), 10-11 years, (M = 129.9 months, SD = 6.1). There were 23 boys and 23 girls in each age category. Using GPower software it was calculated that a sample size of 152 is sufficient for a 2x2x4x4 mixed measures design. Children were recruited from one multicultural primary school in the UK and were predominantly working class and Pakistani (Pakistani 63.0%, White British 12.5% Gypsy Roma 11.4%, White Eastern European 2.7%, Black African 2.2%, White and Black Caribbean 1.1%, Other 7.1%). BMI centiles ranged from 0-100 (M = 54.2, SD = 32.7) and children were grouped into underweight: ≤2nd centile (n = 8), Healthy weight: >2 - <85th centile (n = 135), Overweight or obese: ≥ 85th centile-100th centile (n = 41) for the analysis.

6.2.2. Materials

Two types (Asian and Caucasian) of 4 (girl, boy, woman, man) sets of figure picture cards with each set containing 5 cards (see figure 4.3 and Appendix 6 for full sets) were constructed. Each of the 5 cards showed a figure that was identical in height, but varied in body composition from the others by muscularity and adiposity and comprised of a lean/underweight, average/healthy weight, overweight/obese, muscular and hyper-muscular figure.

6.2.3. Procedure

Children were taken to the test area and before the task their height and weight was measured and Body Mass Index (BMI) calculated.

The task consisted of three counterbalanced conditions, condition 1: Questions about the self, including the child's perceived 'current' and perceived 'ideal' body size and averted self; condition 2: Questions about an ideal body shape

for another child, not the self, and condition 3: Questions about an ideal body shape for an adult (see table 6.1 for questions). Children were given the 4 Asian or Caucasian sets of picture cards and were encouraged to look at and pick up the cards to familiarise themselves with them before they were collected and sorted into groups for the task.

Children were then presented with the appropriate set of cards randomly arranged and asked to pick out one card at a time, in response to the questions within each condition.

Table 6.1 - Task questions for each of the three conditions

Condition 1: Questions about the self: Same sex child cards
• *Which picture looks most like you?* (Current self- Self-identification question used to assess a child's attitude towards their own body) • *Which picture would you most like to look like?* (Ideal self) • *Which picture would you **not** like to look like?* (Averted self)
Condition 2: Questions about an ideal body shape for a child. Opposite or same sex child cards
• *Which picture shows what you think a girl should look like?* • *Which picture shows what you think a boy should look like?* • *(Girl participant) Which picture do you think boys think girls should look like?* • *(Boy participant) Which picture do you think girls think boys should look like?*
Condition 3: Questions about an ideal body shape for an adult. Opposite or same sex adult cards

- *Which picture shows what you think a woman should look like?*
- *Which picture shows what you think a man should look like?*
- *Which picture shows what you would like to look like when you are older?*
- *Which picture shows what you would **not** like to look like when you are older?*
- *(Girl participant) Which picture do you think boys think a woman should look like?*
- *(Girl participant) Which picture do you think boys think a man should look like?*
- *(Boy participant) Which picture do you think girls think a woman should look like?*
- *(Boy participant) Which picture do you think girls think a man should look like?*

6.2.4. Statistical analyses

Body satisfaction was calculated (see chapter 4).

Raw data were entered into an IBM SPSS Statistics package. *Body satisfaction* was analysed with a 2(gender: male x female) by 2(body choice: current x ideal body) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) mixed design analysis of covariance (ANCOVA) with repeated measures on the body choice factor and BMI centile entered as a covariate. BMI category, instead of BMI centile, was also used in the analysis and entered as a fixed factor. Further post hoc analyses were carried out as necessary.

Direction of dissatisfaction was analysed with a 2(gender: male x female) by 2(body choice: current x ideal body) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by 4(perceived body size: muscular, lean, normal weight, overweight) mixed design analysis of covariance (ANCOVA) with repeated measures on the body choice factor and BMI as a covariate, or BMI category entered as a fixed factor.

A MANOVA was used to analyse the DV's: *Ideal self, adult self, averted self and averted adult self*, with gender and age (4-7 years old and 8-11 years old) as fixed factors and BMI centile a covariate. The Bonferroni post hoc was used to examine the effects further.

Ideal body shape for a boy, girl, man or woman were the dependant variables analysed with a MANOVA. Gender was the fixed factor and the Bonferroni post hoc test was used to examine the effects further.

Child's perceived ideal opposite sex will choose for child's own sex: A paired samples t-test was used to compare the ideal self chosen by the child against the ideal the child perceives the opposite sex to choose for their sex.

Ethnicity: To explore the effects of ethnicity on ideal self an ANCOVA was used with gender, ethnicity and age as fixed factors and BMI centile as a covariate.

6.3. Results

6.3.1. Child responses for current perceived body size

The mean child rating for current perceived body size was 3.3 (SD = 1.1). 21.7% of the children (n = 40) reported that they looked most like the muscular figure, 25% (n = 46) the leanest figure, 45.7% (n = 84) the normal weight figure and 7.6% (n = 14) the overweight figure. See figures 6.1 and 6.2 for a breakdown of perceived body size by gender.

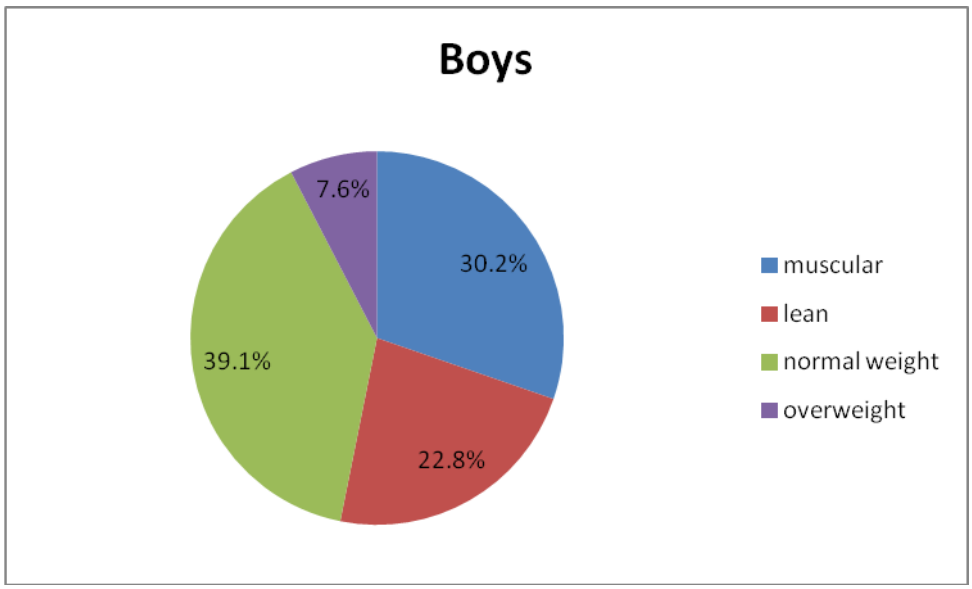


Figure 6.1 – Current perceived body size for boys

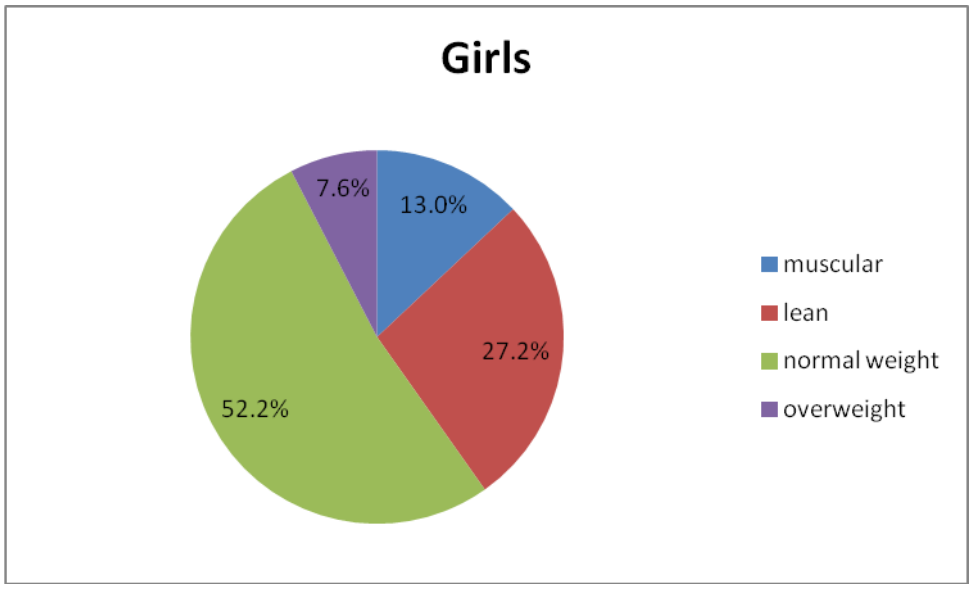


Figure 6.2 – Current perceived body size for girls

6.3.2. Body satisfaction

The mean discrepancy index scores (see table 6.2) indicated that boys and girls within all age groups showed dissatisfaction with their body size.

An ANCOVA was performed using the discrepancy score to investigate if there were any interactions between gender, age and BMI centile. Analysis showed children's satisfaction varied by gender and age. Using gender and age as fixed factors and BMI centile as a covariate, there was a significant effect for Gender, $F(1,8) = 18.49$, $p < .001$ and Age $F(3,8) = 3.36$, $p < .05$, but not BMI ($p > .05$). Here, boys had a higher mean body discrepancy score than girls and a higher percentage of boys than girls were dissatisfied with their body (see Table 6.2). In terms of age, there was a significant effect of Age for boys, $F(3,87) = 3.40$, $p < .05$ and girls $F(3,87) = 5.52$, $p < .01$.

Univariate tests showed there was a significant difference in discrepancy scores between some age groups, but not all. For boys, the 10-11 year old group showed significantly greater dissatisfaction than the 4-5 year old age group $p < .05$, with the 10-11 year old group having the highest mean body discrepancy score overall (see Table 6.2). For girls, the 8-9 year old age group showed significantly less dissatisfaction than the 4-5 year old age group $p < .01$, with the 4-5 year old group having the highest mean body discrepancy score overall.

Examination of the discrepancy between self and ideal ratings revealed that 68.5% of the boys and 38.0% of the girls desired to be leaner and/or more muscular, 19.6% boys and 38.0% girls wanted to stay the same, and 11.9% boys and 24.0% girls wanted to be heavier and/or have less muscle.

Table 6.2 - Discrepancy scores and direction scores by gender and age group

			Boys		**Girls**	
			Discrepancy score	**Direction score**	**Discrepancy score**	**Direction score**
		N	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Age group	**4-5**	**23**	1.13 (1.01)	0.00 (1.54)	1.48 (1.20)	-0.09 (1.93)
	6-7	**23**	1.87 (1.10)	-1.78 (1.24)	1.09 (0.90)	-0.22 (1.35)
	8-9	**23**	1.43 (0.90)	-1.35 (1.03)	0.39 (0.66)	-0.39 (0.66)
	10-11	**23**	2.04 (1.22)	-1.87 (1.49)	0.96 (0.93)	-0.52 (1.24)
	Total score	**92**	1.62 (1.11)	-1.25 (1.52)	0.98 (1.01)	-0.30 (1.36)
% dissatisfaction **N = 88**			80.4% (n = 82)		63.0% (n = 66)	

6.3.3. Direction of dissatisfaction

The direction score was of interest in this study because it revealed more than the discrepancy score by indicating whether a child desired muscularity or adiposity. Depending upon the current body size selected and the magnitude of the discrepancy score, a negative direction score indicated the dissatisfaction in the direction of wanting to be leaner and, or more muscular. A positive direction score indicated the child wanted to be less muscular and, or have more body fat. The mean direction scores (see table 6.2) were negative indicating overall children wanted to be leaner or more muscular.

For both genders the 10-11 year old age group had the largest mean direction score indicating the desire for a more lean and/or muscular body. For girls, the 4-5 year olds had the lowest mean direction score and as girls got older their direction score increased showing a desire towards leaner and/or more muscular figures. There was not a similar pattern for boys; for 4-5 year old boys, the mean direction score was 0, which indicated a desire to stay with the same body type, and boys in the 8-9 year old age group had a lower direction score than the 6-7 or 10-11 year olds, which suggested less desire for a different body shape.

Using an ANCOVA, controlling for BMI centile, to investigate the direction score, there was a significant effect of Gender, $F(1,8) = 22.25$, $p < .001$, where the boys' direction score was higher than the girls' score and in the direction of desiring a more muscular physique compared to the girls.

There was also a significant effect of Age $F(3,8) = 6.18$, $p < .01$, for boys, $F(1,3) = 9.58$, $p < .001$, but not for girls $p > .05$ where boys in the 4-5 year old group demonstrated significantly less dissatisfaction than the 6-7 year old, 8-9 year old and 10-11 year old age groups. The 4-5 year old boys had the lowest mean direction score and the 10-11 year old boys had the highest which indicated a higher desire for muscularity (see table 6.2).

Table 6.3 - Descriptive statistics for direction scores for each perceived current body type

Gender	Current body type	Mean direction score (SD)
Boys	Muscular	-0.11 (1.03)
	Lean	-0.81 (1.47)
	Normal weight	-2.03 (1.11)
	Overweight	-3.14 (1.07)
	Total	**-1.25 (1.52)**
Girls	Muscular	1.50 (1.17)
	Lean	0.16 (0.90)
	Normal weight	-0.71 (0.94)
	Overweight	-2.29 (1.38)
	Total	**-0.30 (1.36)**

6.3.4. BMI and perceived body size

There was no significant effect of BMI centile or BMI category on the children's ideal figure selected ($p > .05$) or on the satisfaction score ($p > .05$) or direction score ($p > .05$).

However, there was a significant effect of the child's perceived current body size on the direction score, for boys, $F(1,4) = 15.84$, $p < .001$ and girls, $F(1,4) = 20.82$, $p < .001$. Looking at the direction and size of the direction score (see table 6.3) boys within all 4 current body size groups desired a more muscular body with the desire increasing the further away from the muscular ideal they perceived themselves to be. This is not the same for girls. Girls who perceived their bodies as muscular wanted to be less muscular. Leaner girls had the

lowest direction and difference score indicating they wanted to stay the same or be slightly less lean. Normal weight girls wanted to be leaner and overweight girls wanted to be leaner and more muscular. Both boys and girls, who perceived their bodies as overweight, had a larger direction score than other groups, in the direction of wanting to be leaner and more muscular. The boys had the largest total mean direction score indicating a greater desire for muscularity (see Table 6.3).

6.3.5. Ideal and averted body choices

A MANOVA (reporting Pillai's trace) showed the ideal and averted body choices varied significantly by gender, $F(1, 176) = 35.60$, $p < .001$ and age, $F(1, 176) = 4.50$, $p < .01$, but not BMI $p > .05$.

6.3.5.1. Ideal self

A significant gender difference in the body boys and girls chose as ideal $F(1, 179) = 63.27$, $p < .001$, was found. The mean rating for the boy's ideal self was 1.88 (SD = 1.19), where 77.1% of boys named the muscular figures as an ideal (54.3% the hypermuscular figure and 22.8% the athletic muscular), 13.0% named the healthy weight figure, 6.5% named the lean figure, and only 3.3% named the overweight figure as an ideal (see figure 7.3). The mean for the girl's ideal self was 3.16 (SD = 0.99), where 46.7% named the healthy weight figure, 27.2% named the lean figure, 25.0% named the muscular figures (7.6% the hypermuscular figure and 17.4% the athletic muscular), and only 1.1% named the overweight figure as an ideal (figure 7.3).

There was not a significant effect of age on the figure 4-7 year olds and 8-11 year olds chose as an ideal self ($p > .05$). The mean ideal score for the figure boys aged 4-7 years old chose was 2.09 (SD =1.38) and boys aged 8-11 years old was 1.67 (SD = 0.94). 54.3% of younger and 54.3% of older boys picked the hypermuscular figure as an ideal. The mean ideal score for girls aged 4-11 years old was 3.07 (SD = 1.04) and 7-11 year olds was 3.26 (SD = 0.93). 39.1% of younger and 54.3% of older girls picked the normal weight figure as an ideal.

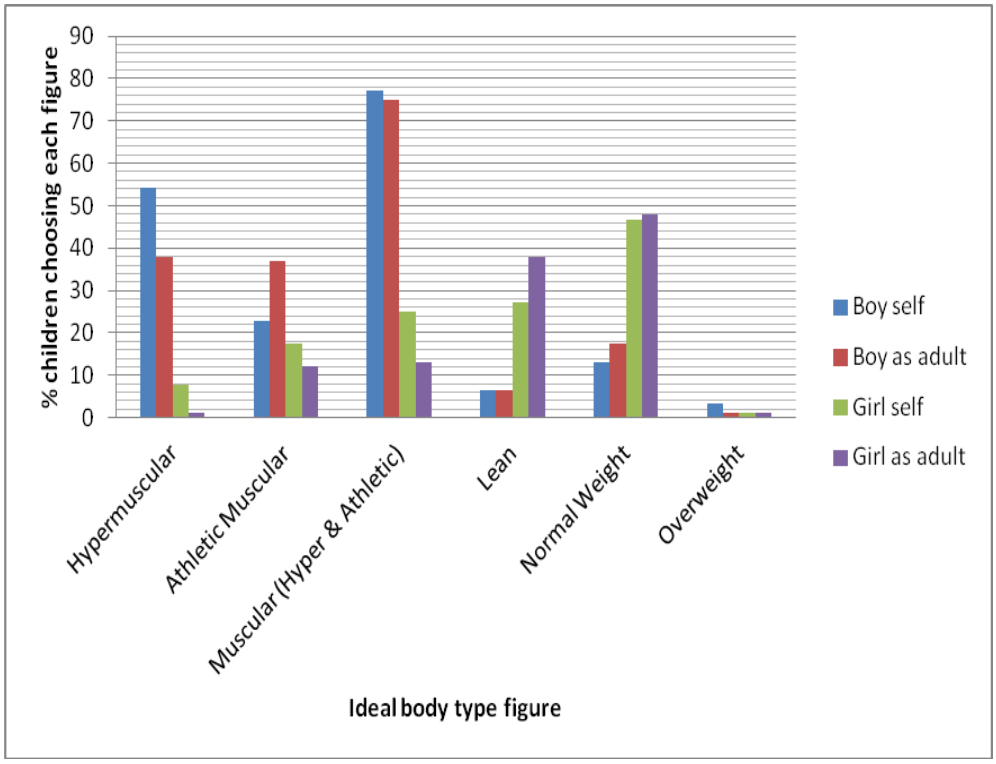


Figure 6.3 - Percentage of children choosing each figure type as their ideal body for self and as an adult. *Note: The muscular category combines the hypermuscular and athletic muscular body types into one group to show a combined muscular choice.*

6.3.5.2. Ideal adult self

There was a significant gender difference in the body boys and girls chose as ideal adult self: $F(1, 179) = 86.56$, $p < .001$. The mean for the boy's ideal self as an adult was 2.07 (SD = 1.12). For the girls it was 3.36 (SD = .75). 75% of the boys chose a Muscular figures were chosen as an ideal by 75% of the boys for when they were an adult (38.0% the hypermuscular figure and 37.0% the athletic muscular), 17.4% named the healthy weight figure, 6.5% the lean figure, and only 1.1% named the overweight figure as an ideal (see figure 6.3). 47.8% of girls chose the healthy weight figure and 38.0% chose the lean figure as an ideal adult self, 13.1% the muscular figures (1.1% the hypermuscular figure and 12.0% the athletic muscular), and only 1.1% named the overweight figure as an ideal (figure 6.3).

There was a significant effect of age on the figure 4-7 year olds and 8-11 year olds chose as an ideal adult self: $F(1, 179) = 7.27$, $p < .01$. The mean ideal score for the figure boys aged 4-7 years old chose was 1.91 (SD =1.23) and 8-11 year olds was 2.22 (SD = 0.99). 56.5% of younger boys picked the hypermuscular figure in contrast to and 58.7% of older boys who chose the athletic muscular figure. The mean ideal score for girls aged 4-11 years old was 3.17 (SD = 0.77) and 7-11 year olds 3.54 (SD = 0.69). 52.2% of younger girls picked the lean figure in contrast to 65.2% of older girls who chose the normal weight figure.

6.3.5.3. Averted self

No significant gender difference in the body boys and girls chose as an averted self ($p > .05$) was found. The mean averted score for boys was 4.51 (SD = 1.02) and girls 4.43 (SD = 1.23). 79.3% of boys and 79.3% of girls named the overweight figure as the figure they did not want to look like. 13.0% boys and 4.3% girls chose the leanest figure, 4.3% boys and 4.3% girls chose the athletic muscular figure, 2.2% boys and 7.6% girls chose the hypermuscular figure and only 1.1% of boys and 4.3% of girls chose the normal weight figure as the figure they would not want to look like.

There was a significant effect of age on the figure 4-7 year olds and 8-11 year olds chose as an averted self: $F(1, 179) = 8.22$, $p < .01$. The mean averted-self score for the figure boys aged 4-7 years old chose was 4.33 (SD =1.23) and 8-11 year olds was 4.70 (SD = 0.73). Fewer younger boys (73.9%) picked the overweight figure as the one they did not want to look like than older boys (84.8%). The mean averted-self score for girls aged 4-11 years old was 4.22 (SD = 1.37) and 7-11 year olds 4.65 (SD = 1.06). Again fewer younger girls (69.6%) picked the overweight figure than older girls (89.1%).

6.3.5.4. Adult averted self

There was not a significant gender difference in the body boys and girls chose as an averted adult self ($p > .05$). The mean averted score for the boy's self as an adult was 3.62 (SD = 1.70) and girls 3.96 (SD = 1.67). 55.4% of boys and

68.5% girls chose the overweight figure and 23.9% boys and 21.7% girls chose the hypermuscular figure as the ones they did not want to look like as an adult.

There was not a significant effect of age on the figure 4-7 year olds and 8-11 year olds chose as the figure they did not want to look like when they were older ($p > .05$). The mean ideal score for the figure boys aged 4-7 years old chose was 3.59 (SD =1.68) and 8-11 year olds was 3.65 (SD = 1.74). 52.2% of younger boys and 58.7% of older boys picked the picked the overweight figure. A similar number of older boys (26.1%) and younger boys (21.7%) picked the hypermuscular figure as the one they did not want to look like when they were older. The mean ideal score for girls aged 4-11 years old was 4.41 (SD = 1.28) and 7-11 years old was 3.50 (SD = 1.89). 78.3% of younger girls and 58.7% of older girls picked the overweight figure. 34.8% of the older girls in contrast to 8.7% of the younger girls picked the hypermuscular figure as the one they did not want to look like when they were older.

6.3.6. Ideal body shape for boy, girl, man and woman

A MANOVA (reporting Pillai's trace) showed the ideal body choices varied significantly by gender, $F(1, 179) = 2.39$, $p < .05$.

However, no significant gender difference in the figure chosen as an ideal boy ($p > .05$) was found. The mean ideal boy score for the boys choice was 2.83 (SD = 1.24) and the girls' choice was 3.00 (SD = 1.35). 43.5% of boys and 37.0% of girls picked the muscular figures as the ideal body shape for a boy. 39.1% of boys and 33.7% of girls picked the normal weight figure as the ideal body shape for a boy (see figure 6.4).

There was a significant gender difference in the figure chosen an ideal man: $F(1, 182) = 4.68$, $p < .05$. The mean ideal man score for boys was 2.42 (SD = 1.25) and girls was 2.80 (SD = 1.13). 64.1% of boys and 43.5% of girls picked the muscular figures as the ideal body shape for a man. 25.0% of boys and 26.1% of girls picked the normal weight figure and 6.5% boys and 25.0% girls picked the lean figure as an ideal body shape for a man (see figure 6.4).

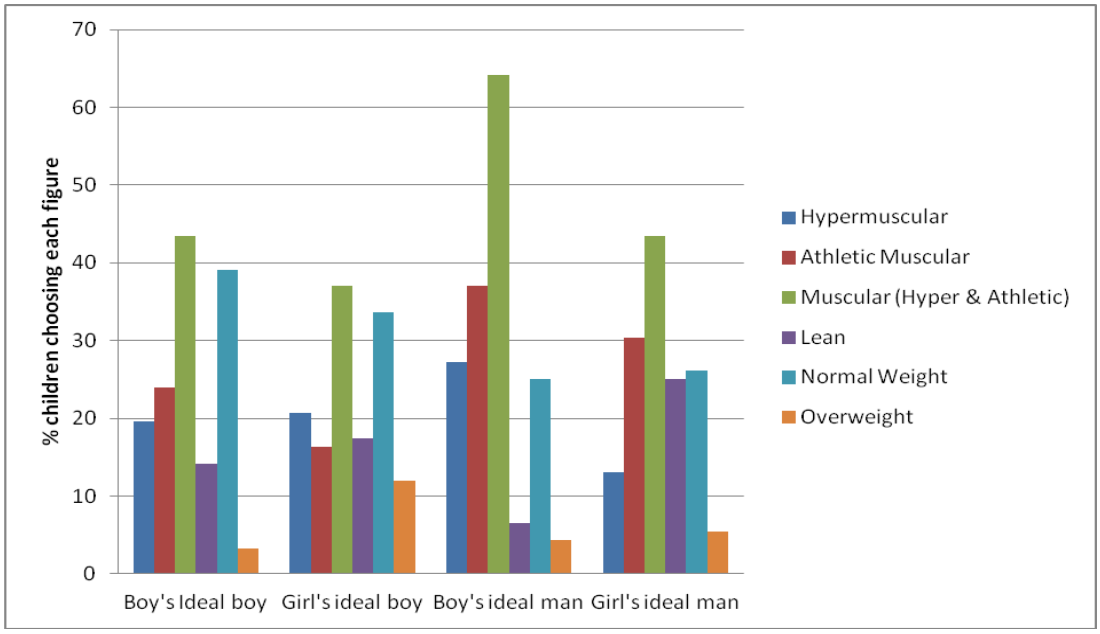


Figure 6.4 - Percentage of children choosing each figure type as an ideal body for males

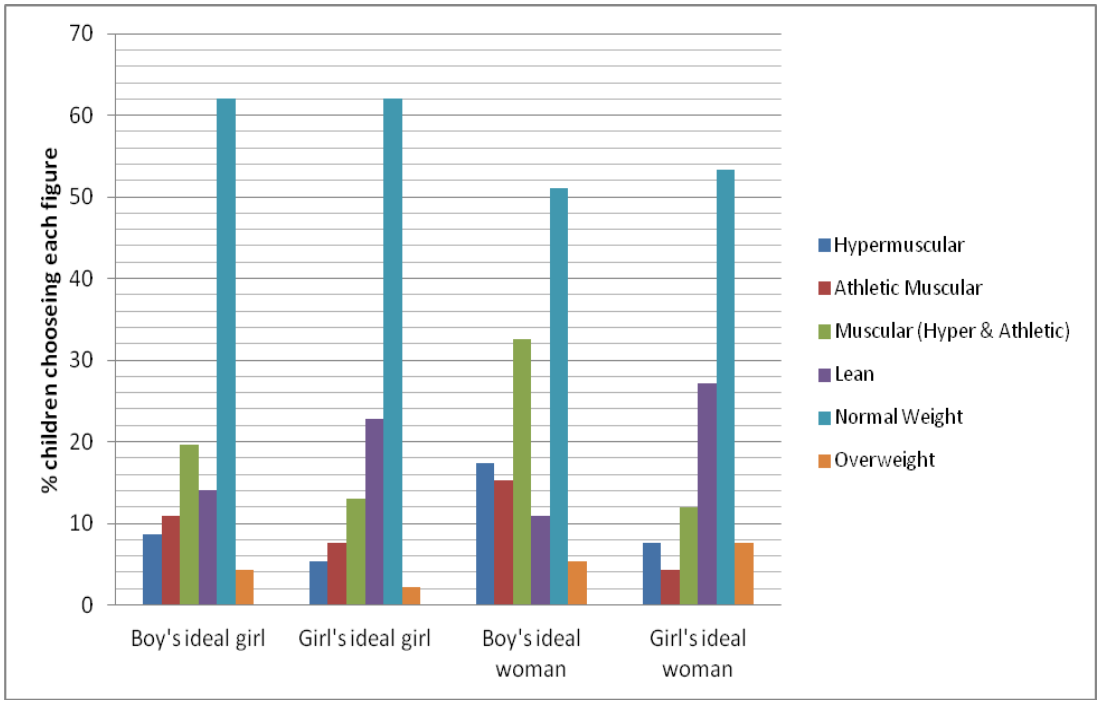


Figure 6.5 - Percentage of children choosing each figure type as an ideal body for females

No significant gender difference in the figure chosen as an ideal girl ($p > .05$) was found. The mean ideal girl score for boys was 3.42 (SD = 1.04) and girls was 3.48 (SD = 0.89). 62.0% of boys and 62.0% of girls picked the normal

weight figure and 14.1% boys and 22.8% of girls picked the lean figure as the ideal body shape for a girl (see figure 6.5).

A significant gender difference in the figure chosen as an ideal woman: $F(1, 182) = 4.96$, $p < .05$ was found. The mean ideal woman score for boys was 3.12 (SD = 1.23) and girls was 3.49 (SD = 0.98). 51.1% of boys and 53.3% of girls picked the normal weight figure as the ideal body shape for a woman. 27.2% girls picked the lean figure and 32.6% boys picked the muscular figures as an ideal body shape for a woman (See figure 6.5).

6.3.7. Child's perceived ideal opposite sex will choose for child's own sex

A paired samples t-test was used to compare girls' ideal self against the ideal a girl perceived a boy to choose for a girl. There was not a significant difference (Mean difference = .30) between the ideal figure chosen by girls and the figure they thought boys would choose ($p > .05$). The mean score for the girl's ideal self was 3.45 (SD = 0.96) and what they perceived boys would choose 3.00 (SD = 1.20).

However, the girls chose an ideal self that was significantly leaner than the ideal they picked for a girl (*for ideal self- ideal girl, M* = -.32), paired $t(91) = -2.30$, $p = .024$.

A paired samples t-test was used to compare boys' ideal self against the ideal a boy perceived a girl to choose for a boy. Boys chose an ideal figure that was significantly more muscular than the figure they perceived a girl would choose for a boy (*for ideal self – perceived opposite sex, M* = -.53), paired $t(91) = 2.97$, $p = .004$. The mean score for the boy's ideal self was 2.91 (SD = 1.29) and what they perceived girls would choose 2.52 (SD = 1.41)

Boys also chose an ideal self that was significantly more muscular than the ideal they picked for a boy (*for ideal self- ideal boy, M* = -.95), paired $t(91) = -5.58$, $p < .001$.

6.3.8. Ethnicity

The effects of ethnicity were explored in this study due to the differences in the figure chosen by the girls as an ideal self in comparison to study 1. There was a significant effect of ethnicity on the figure chosen as a body ideal: $F(7, 159) = 2.23$, $p < .05$. The children in the White Eastern European group chose a significantly different ideal body figure to children in the Pakistani group and the children in the White English group. Further exploration revealed it was the girl's ideal self choices that differed significantly by ethnicity: $F(1, 84) = 2.22$, $p < .05$ and not the boy's ($p > .05$). Boy's mean figure choice was around the muscular figures for all groups. Examination of the effect showed there was a significant difference for girls in the ideal figure chosen by some ethnic groups, but not all. The mean figure chosen by the Pakistani girls was 3.07 (SD = 0.98), the White British girls 2.20 (SD = 1.30) and the White Eastern European girls 4.20 (SD = 0.45). These means indicate the Pakistani girls chose the leanest figure, White British girls the athletic muscular figure and White Eastern European girls the normal weight figure.

6.4. Discussion

Key findings:

- Boys had higher body dissatisfaction than girls.
- Stereotypical idealised body perception was seen in young children where boys wanted to be muscular, girls wanted to be lean, and both sexes did not want to look like the overweight figure as a child or adult
- Ideal body choices saw boys choosing more muscular figures and girls more lean figures for the self, than the ones they choose for another boy or girl.
- Boys choose more muscular ideal figures than what they perceive the opposite sex would choose.
- Girls, but not boys, from different ethnic groups, varied in their ideal body choices.

- There was an increasing awareness of stereotypical idealised body shape ideals with age.

The objectives of this study were to investigate 4 to 11 year old children's perception of the 'ideal' body shape for different groups of males and females through the use of a modified version of the scale from study 1 (using 7 full figures instead of 9 torsos, arms and legs), which incorporated both muscularity and adiposity. This aimed to reveal whether a stereotype existed for children around how male and female bodies should look.

In terms of their own bodies, the pattern of results for the children were similar to those found in study 1. A high number of boys and girls demonstrated dissatisfaction with their bodies and boys were much more dissatisfied with their body size than girls, a finding which contrasted with published research (see McCabe & Ricciardelli, 2001; Tremblay et al, 2011). This is likely due to use of the figure scale measure which incorporated both muscularity and adiposity and allowed children, particularly boys, to choose muscular options. Indeed the use of this measure revealed a quarter of girls and over three quarters of boys chose the muscular figures as an ideal self, which reflected results from research employing questionnaire methods that found both boys and girls desired to increase their muscularity (see Ricciardelli et al, 2003; McCabe et al, 2005; 2006). However, the use of a visual scale in the current study meant it was demonstrated at a younger age.

In contrast to other studies, only a small number of boys and girls selected a heavier ideal than their current body size (for example see Collins,1991; Markovic et al, 1998; Schur et al, 2000; Truby & Paxton, 2002). Far fewer children in the current study (only four from the youngest age group) chose the overweight figures than seen in other studies (see Riciardelli & McCabe, 2001; Truby & Paxton, 2008) and so perhaps the measure more clearly separated bulk due to adiposity, and bulk due to muscle, as found in study 1. Here children were not confused over the two separated dimensions (muscularity and

adiposity) as they may have been with other figure scale measures, where both dimensions are not included (see Cohane & Pope, 2001 for a review).

Again, there were significant gender differences in the pattern of body image dissatisfaction, which indicated an awareness of a stereotype for idealised bodies for males and females developing at an earlier age than found in other studies that record the development between the ages of 8 and 10 years old (Thelen et al, 1992; Gardner et al, 1997; Ricciardelli & McCabe, 2001). Overall, boys wanted to be muscular and girls wanted to be lean, as found in other research (see Schur et al, 2000; Truby & Paxton, 2002; Ricciardelli et al, 2006; McCabe et al, 2007). However, fewer girls in this study than in study 1, picked the lean figure as an ideal. Just less than half picked the normal weight figure, over a quarter the muscular figure and a quarter the lean. The differences in results between the studies could be explained by variation between the two cohorts, where the children in the current study were of lower socio-economic status and from a more diverse range of ethnicities, than the first.

Examination revealed ethnicity to be a significant factor affecting the girls' choice of figure for an ideal body, and most Pakistani girls chose a lean ideal figure, White British girls, the athletic muscular figure and White Eastern European girls, the normal weight figure. Pallan et al's (2011) research supports these results, finding that Pakistani girls living in the West chose a lean figure as an ideal and were thus aware of the Western ideals for body size. As a result of this, they rejected the larger body size traditionally desired by their culture (Pallan et al, 2011). Interestingly, most boys from these 3 ethnic groups chose the muscular figures as an ideal body in the current study, perhaps suggesting the muscular male stereotype is more pervasive across different cultures. Research with preadolescent males in this area is limited, so further investigation is required.

In support of the findings in study 1, BMI was not a factor in body dissatisfaction, as suggested in some other studies (see McCabe et al, 2006), but *perceived* body size was (as in Canpolat et al, 2005; Dion et al, 2016). For

both boys and girls, those who perceived their bodies as overweight, were the most dissatisfied with their bodies. It is likely the children who were overweight were aware of body stereotyping against being overweight and had the poorest body perception, thus leading them to choose a figure the furthest from their current perceived figure (see chapters 2 and 5 for further discussion). Interestingly for boys, the further away they perceived their body to be from being muscular, the higher the mean score was in the desire for a muscular body, thus suggesting boys have internalised the stereotype of a muscular body as an ideal body type for males (Grogan & Richards, 2002; Labre, 2005; Thompson & Cafri, 2007; Tiggeman, 2011a). For girls, the results were very similar for those found in study 1. If girls perceived their bodies as normal weight or overweight, they desired to be leaner and if they were lean, they wanted to remain lean, thus suggesting a bias for girls towards being leaner as found in other research (Cohn & Adler, 1992). Interestingly, girls who perceived their bodies as muscular, wished to be less muscular, perhaps demonstrating awareness of the desired 'feminine' level of muscularity for women, as found in study 1 (see Forbes et al, 2004; Grogan et al, 2004 and chapter 2 for a discussion).

Consistent with research, body size stereotyping was evident at a young age (Cramer & Steinwert, 1998; Musher-Eizenman et al, 2004; Spiel et al, 2012) with almost 80% of the girls and boys picking the overweight figure as the one they would not want to look like as a child. Only four children from the youngest age group picked an overweight ideal figure and fewer girls than boys did. This suggested that an awareness of a stereotype for being overweight develops at a young age and perhaps earlier for girls than boys (Holub, 2008). Indeed, more girls than boys also chose the overweight figure as the one they would not like to look like as an adult. This perhaps indicates that girls are aware that female bodies, more than male bodies, are objectified and judged on appearance, making higher adiposity less desirable due to the 'thin ideal' stereotype (Levine & Smolak, 2002). Most children did not want to be overweight, and overall the overweight figure was chosen the least as a body ideal for a boy, girl, man or woman, which suggested children were conscious of the negative weight

attitudes and stereotypes around having a higher adiposity (Rothblum, 1992; Brylinsky & Moore, 1994; Neumark-Sztainer et al, 1998; Musher-Eisenman et al, 2003; Spiel et al, 2012; Worobey & Worobey, 2014) which could influence their beliefs around the body sizes they deem acceptable (Tiggemann & Pennington, 1990).

Furthermore, there also seemed to be a bias around not being too bulky or overly muscular as an adult, with over a fifth of boys and girls picking the hypermuscular figure as the one they would not like to look like as an adult. The rejection of the hypermuscular figure by these boys could be due to their awareness of the societal ideal for a man having a lean, V-shaped body with a 'moderate' amount of muscle, without extreme hyper-muscularity (Grogan & Richards, 2002). For females, thin, toned and physically fit is desirable (Forbes, et al, 2004; Thompson et al, 1999; Tiggeman, 2011a), but too much muscle is not wanted and is viewed as unfeminine (Dworkin, 2001; Hobson, 2002; Grogan et al, 2004) and awareness of this stereotype for women could have influenced the girls' choices. In support of this, many more older girls (8 to 11 years old), than younger (4 to 7 years old), chose the hypermuscular figure as the aversive adult figure, possibly due to a greater awareness of body shape ideals developing with age.

Age was a factor in the current study, which differed to study 1, because although body dissatisfaction was evident across all age groups, there was a different pattern of dissatisfaction across the different age groups for boys and girls. Looking at the discrepancy score, the oldest boys (aged 10 to 11 years old) were significantly more dissatisfied than the youngest boys (aged 4 to 5 years old). Some findings suggest body dissatisfaction increases with age for boys (for example, see Kostanski et al, 2004; Eisenberg et al, 2006). Perhaps this reflects a growing awareness for boys of the cultural ideals and how their bodies compare to the ideal, as they get older.

In contrast to research which suggested body dissatisfaction increases with age for girls (for example, see Clay et al, 2005; Li et al, 2005; Eisenberg et al, 2006),

the 4 to 5 year old girls showed the most body dissatisfaction and were significantly more dissatisfied than the 8 to 9 year olds, where the 8 to 9 year olds demonstrated the least body dissatisfaction. The 8 to 9 year old boys also had the second lowest dissatisfaction score. Why this age group would have relatively low body dissatisfaction in comparison to some of the other age groups is not easily explained. However, because this study was cross sectional, the lower body dissatisfaction for this age group could be due to cohort effects. There may have been an educational intervention at the school that could have promoted a healthy body image within this age group, for example.

Moreover, perhaps it was also due to the stage of cognitive development the different aged children were at. Dittmar et al (2006) found younger girls (aged 5.5 to 7.5 years old) demonstrated greater body dissatisfaction after viewing a thin Barbie doll, than older girls (aged 7.5 to 8.5 years old). It has been suggested that the younger children are building their self-concept at this age (Eccles et al, 1993) and could be affected by the thin ideal messages being conveyed by the doll because they identify with it more as a role model (Dittmar et al, 2006). In contrast, the older children are able to recognise multiple perspectives, and so reject the doll as a role model, thus their body image is not as directly affected by the thin ideal projected by the doll, but the thin-ideal has already been internalised (Dittmar, 2012).This will be explored further in chapter 8.

Furthermore, on examination of the ideal figure choices the girls made, the youngest girls picked a wider range of figures as an ideal, including some choosing the overweight figure. This was also found in study 1. Picking a wider range of figures suggested that at this age the children were less sure of how they would like their ideal body to look, perhaps because they had not yet internalised the thin ideal as a personal preference for their own appearance at the ages of 4 to 5 years old. Research supports this concept, and found the thin ideal internalisation developed in girls aged 8 years old (Blowers et al, 2003; Eddy et al, 2007), although Harriger (2010) found evidence of internalisation in

some 3 to 5 year old girls. It could be that in the current study, children who have internalised the thin ideal, are picking the thinner figures, and those that have not yet internalised the ideal, are picking from the others.

Another explanation could be that younger children chose different figures without perhaps assessing what was realistic and achievable for their own body, as in study 1. This was also indicated in the current study when children chose an ideal adult self. The younger boys aged 4 to 7 years old desired a hypermuscular figure, but the older boys aged 8 to 11 years old, the more realistic athletic muscular figure. Moreover, the younger girls preferred the lean figure and older girls the normal weight figure as an adult ideal. Both the thinner and hypermuscular figures were the ones that demonstrated a body image that is difficult to achieve with healthy means, much like the unattainable body proportions presented by the Barbie doll and action figures (Pope et al, 1999; Dittmar et al, 2006). There could be a change in the development of body ideals with age and perhaps older children may be more realistic about the figure they can desire and attain as an adult. Some research supports this idea. When asked to choose a figure that is the most attractive, the youngest children (aged 6 years old) chose the thinner figures and a preference for the normal 'healthy' weight figure increased with age (Connolly et al, 2004). In addition, children as young as 4 chose the 'thinner than normal' adult female bodies as the most attractive (Brown & Slaughter, 2011).

Interestingly, the 8 to 9 year old girls who demonstrated the lowest dissatisfaction picked from the lowest range of figures (athletic muscular, lean and normal weight) of all of the age groups and so could have a narrower range of body ideals than other age groups and are perhaps more influenced by messages around acceptable body sizes. Moreover, the 10 to 11 year old girls had higher body dissatisfaction compared to the 8 to 9 year olds, which could be the result of the girls becoming more dissatisfied with their bodies due to the effects of puberty (as supported by McCabe & Ricciardelli, 2001). Puberty represents a time of weight gain for some girls (McCabe & Ricciardelli, 2004)

and bodily changes may move their bodies further from the thin ideal (Rosenblum & Lewis, 1999; Tiggemann, 2004).

In contrast, when using the direction score instead, a similar picture emerges for boys, as explained with the discrepancy score. However, for girls this time, it is the youngest age group that have the lowest mean direction score and the oldest girls that have the highest. Results indicated that as girls get older their direction score increased with older children showing a greater desire towards leaner and/or more muscular figures. This is consistent with the finding that body dissatisfaction increases with age for girls (for example see Eisenberg et al, 2006). As was the suggestion for boys, this could be due to the development of a greater awareness of and internalisation of the stereotypical cultural ideals for body shape with increasing age and an understanding of how their bodies compare to them. Body ideals are transmitted daily through the family, peers, and mass media, specifically media aimed at children, such as action figures and dolls. These communicate values and attitudes around physique, appearance, and weight, which children internalise over time (see for example Ricciardelli & McCabe, 2004; Halliwell & Harvey, 2006, and chapter 2 for a discussion). Thus it is necessary to investigate what boys and girls are exposed to in their daily environment to help explain these patterns (see study 4, chapter 8).

This research has highlighted the different patterns of dissatisfaction that has emerged from the data when reporting body dissatisfaction using the discrepancy score (ideal vs actual) and the direction of dissatisfaction (whether children want to be larger or smaller). This reflects the complexity of this area of study, indicating that there are many factors involved which cannot be fully explained yet, but potentially influence the results. These seemingly different results for girls also highlights the need for researchers to use the direction score to investigate body image thoroughly, as it could be a better indicator of the desire for idealised body shape than the discrepancy score.

Moreover, there was further evidence of stereotypical idealised body perception demonstrated in this study. Boys and girls had similar ideas about how children's and adult's bodies should appear. The ideal body shape picked for a boy was muscular, with normal weight a close second choice, and the muscular figures were chosen as an ideal for a man. This suggested that the children were aware of the muscular body sized stereotype for men and boys and it influenced their choices (see for example Thompson & Cafri, 2007 and chapter 2 for discussion).

Interestingly, more boys than girls picked a muscular ideal and more girls than boys picked a lean ideal for a man. This suggested that boys placed more importance on muscularity for men than girls did and could explain why three quarters of the boys picked a muscular figure as a future ideal adult physique for themselves. This mirrored the results of Fallon and Rozin's (1985) study, where women preferred a thinner figure for a man than the men actually chose. Stereotypes research suggests the awareness of, and perhaps internalisation of a thin ideal for both male and female bodies starts as early as 3 to 5 years old (see Musher-Eisenman et al, 2003; Spiel et al, 2012; Sagone & De Caroli, 2013). However, there is limited research around stereotypes of muscular bodies and so it is difficult to know whether the awareness and internalisation of a muscular ideal also develops, as the thin ideal does, at this age. This is explored further in study 3, chapter 7.

The ideal girl and woman was perceived as being normal weight, as picked by over half of the boys and girls. However, the second choice for the woman differed between boys and girls. Similarly to the ideal choice for a man above, boys placed more importance on muscularity, demonstrated by a third picking the muscular ideal woman figures. In contrast, girls placed greater importance on being lean with over a quarter choosing the lean figures as an ideal woman. Muscularity in women does not seem to be as important for girls as it seemed to be for boys, and this was confirmed by the girls' choice of normal weight and leaner figures as their future ideal adult self. Perhaps again this reflected the girl's awareness of the societal ideals for a woman of attaining a thin, but

physically fit body (see Thompson et al, 1999; Forbes, et al, 2004) and not building too much muscle (Forbes et al, 2004; Grogan et al, 2004). Twice as many girls, than boys, chose the lean figure as an ideal for girls, thus confirming being lean is more important to girls (for example see, Truby & Paxton, 2002; Dion, 2016) and published research suggests they think about being thin more than boys do (Shapiro et al, 1997). Around a third of boys and girls thought it was important for men and women to be thin (Shapiro et al, 1997), but there is a lack of research into the importance of muscularity.

For both boys and girls, there was a disparity between the ideal picked for another boy and girl and the ideal they desired for the self. Girls chose an ideal self that was significantly leaner than the ideal they picked for 'a girl' and boys chose an ideal self significantly more muscular than the ideal they picked for 'a boy'. It seemed that many girls had developed a bias toward thinness and boys towards muscularity and although the children were aware that the ideal figure for another child was less lean for girls or less muscular for boys, they choose a leaner or more muscular figure for themselves. This was also found in Cohn et al's (1987) study and the authors suggested that the pressures motivating these choices extend beyond opposite sex preferences and considerations.

Furthermore, in the current study, many children commented on wanting to make a choice of a 'normal' figure ('*I want one that looks normal*'), which they identified as the normal weight figure, but not when choosing for the self. What constitutes a 'normal' body size may have increased over the years due to the obesity epidemic, and there could be a discrepancy here between what the children considered to be a normal body size and the actual 'normal' size of the population. Findings in the current study showed there was a difference between the choice of ideal other figure and ideal self. Published research revealed similar discrepancies where 7 to 11 year old girls rated their ideal figure as significantly thinner than the one they perceived as attractive to boys (Tiggemann & Wilson-Barrett, 1998). In addition, these results were in line with those of Brown and Slaughter (2011), who found that for all age groups (aged 4 to 26 years old), the figure chosen as the most attractive female body, was

thinner than what was perceived as the most normal. Although these authors did not ask children to choose an ideal self, they suggested that when children are asked to pick in this way, they are susceptible to choosing what they perceive to be the socially accepted body shape and are attempting to choose the 'correct' figure. In the case of the current study, the children's ideal body shape as an adult or child self, reflected the stereotypical idealised body shapes for males and females. Thus again demonstrating that the awareness of body shape ideals for males and females develops at a young age and these influence the child's choice of ideal figure for the self. Whether children genuinely desired these figures as an ideal for their own bodies, or simply wished to make a 'correct' choice, warrants further investigation.

In contrast to studies where females overrate opposite sex preferences for thinner figures (see Cohn & Adler, 1992), in the current study, the girls' choice of ideal figure matched the figure they perceived a boy would choose for a girl, which was towards the lean figure. This perhaps reflected the awareness the girls had of the importance of the thinness ideal for the female figure (Connolly et al, 2004; Benninghoven et al, 2007; Smith et al, 2007) and the understanding that their attractiveness will often be judged on physical and not personal characteristics by males (see Mazur, 1986; Stiles et al, 1990). However, the boys' choice of ideal figure for the self was more muscular than the figure they perceived a girl would choose for a boy, contrasting with research which found that boys and men overestimate the muscularity females find desirable for males (Cohn et al, 1987; Cohn & Adler, 1992; Fallon & Rozin, 1985). This suggested that the boys placed more importance on muscularity for males than the girls did, which is consistent with research findings (McCabe et al, 2005). Findings such as these indicate the beginning of the development of a distorted view of the figure boys perceive as an 'ideal', suggesting boys may feel the similar body pressures girls do, which could later impact on their body perception.

6.4.1. Conclusions

In using a modified version of the scale from study 1, which incorporated muscularity and adiposity, many of the findings in study 1 were replicated. A higher number of boys and girls were dissatisfied with their bodies than in other studies, boys reported higher body dissatisfaction than the girls and boys desired to be muscular and girls lean. Gender, age, ethnicity and perceived body size were factors that affected children's body image and these should be examined further in future studies.

Asking children to choose ideal figures for males and females varying in adiposity and muscularity has given an insight into the development of body shape ideals. If children develop an awareness of gendered categories relating to how males and females should look and behave at a young age (Thompson & Bentler, 1971; Zosuls et al, 2009), it indicates that a stereotype for what makes an 'ideal' male or female body could also develop, as demonstrated in the current research. Stereotypical idealised body perception was seen in young children where boys wanted to be muscular, girls wanted to be lean and both sexes did not want to look like the overweight figure as a child or adult. However, we do not know why children were making the choices they were because we do not know how they perceived the figures of differing adiposity and muscularity. Attributes research exploring stereotypes held around different figures may help to answer this question. Furthermore, it seems that messages delivering fixed stereotypical ideas around appropriate body size and shapes for males and females are reaching children of a young age, possibly due to idealised images promoted through different avenues, which could include the media (Blond, 2008; Hargreaves & Tiggemann, 2004; Mulgrew et al, 2014), parents and peers (Ricciardelli et al, 2000). Whether these influences are impacting on these young children remains to be elucidated.

6.4.2. Future directions for research

As attitudes about body sizes held by children are likely to influence their beliefs around acceptable body sizes (Tiggemann & Pennington, 1990) future research needs to explore the negative weight attitudes and stereotypes held around

different figures varying in adiposity and muscularity, through the attributes assigned to these figures. Areas for further study are:

- To explore the attributes assigned to figures differing in adiposity and muscularity and understand how this varies by age and gender.
- To find out which figures are chosen for positive and negative attributes.
- To find out which figures are chosen to be friends with or not to be friends with.
- To further examine some of the factors (age, gender, BMI, perceived body size) on body satisfaction, the direction of dissatisfaction and ideal body choice.

Chapter 7

Attributes assigned to different sized and shaped figures:

7.1. Introduction

The previous two studies have revealed significant gender differences in body satisfaction where boys reported a higher body dissatisfaction than girls and more boys than girls were dissatisfied with their body and body parts. The use of a novel body satisfaction scale assessing both muscularity and adiposity showed that boys desired a more muscular figure and girls a leaner figure. These findings are consistent with published research (see Gardner et al, 1999a; Davison et al, 2000; Ricciardelli et al, 2006; McCabe et al, 2007 and chapter 2 for a review of the literature).

Study 2 revealed that boys and girls held a stereotypical idealised body perception, specifically choosing muscular bodies for males and lean for females, which reflected the Western stereotypes around the desirable body sizes for males and females (Grogan & Richards, 2002; Thompson & Cafri, 2007; Tiggeman, 2011a). Even the youngest children aged 4 years old held these beliefs and so this indicated that idealised body perception develops at an early age (see for example, Sagone & De Caroli, 2013) and children may feel pressure to conform to the two distinct male and female body shapes upheld in society (Barlett et al, 2008). Findings also showed that children's awareness of the thin ideal or muscular ideal increased with age. Moreover, when choosing their ideal self, boys chose more muscular figures and girls more lean figures, compared to those they chose for another boy or girl. This further demonstrated the girls' bias toward thinness and boys' towards muscularity. Boys also choose a figure significantly more muscular than the figure they perceived the opposite sex would choose (as supported by Cohn et al, 1987; Cohn & Adler, 1992; Fallon & Rozin, 1985), whilst girls chose one as lean as the figure they perceived boys would choose, further emphasizing the importance of thinness for females and muscularity for males (see for example, Winkler & Rhodes, 2005; Benninghoven et al, 2007).

Children showed aversion to the overweight figure selecting it the most often as the one they would not like to look like as a child or adult. Published research reports that overweight children face peer rejection (see chapter 2 for a discussion). When an underweight, average weight and overweight figure is presented to a child and they are asked which one they would like to be friends with and why, most children prefer the underweight and average weight figures; the overweight figure is perceived as the most aversive and mean (Cramer & Steinwert, 1998; Musher-Eizenman et al, 2004). Overweight builds are also assigned more negative attributes than the other figures (Brylinsky & Moore, 1994; Cramer & Steinwert, 1998; Musher-Eizenman et al, 2004; Spiel et al, 2012), for example, boys aged 5 and 15 years old judged the overweight build the most unfavourably on physical (e.g. strong-weak), personal (kind-mean) and social characteristics/attributes (has many friends-few friends) (Lerner & Korn, 1972). Interestingly, children with overweight builds themselves, have a negative attitude towards overweight figures (Lerner & Korn, 1972; Cramer & Steinwert, 1998). Other studies show it is not actual, but perceived body size that influences attitudes, and the children who think they are heavier have *less* bias towards overweight figures (Kornilaki, 2015). Moreover, children whose mothers were dissatisfied with their bodies were less likely to choose a larger figure for negative characteristics, perhaps the result of these mothers shielding their children from the negative messages about larger body sizes (Spiel et al, 2012).

The role of gender on weight attitudes needs to be clarified as research yields mixed findings. Holub (2008) found preschool girls to hold more 'anti-fat' attitudes than boys, whereas Cramer and Steinwert (1998) found no difference. However, in other studies girls rated the underweight figure more favourably than boys did (Brylinsky & Moore, 1994) and preferred the underweight to average or overweight figures (Palmer & Rutland, 2011). In terms of age, there is evidence that the development of negative attitudes towards overweight builds for the self and others begins in the preschool years, but develops with age, as 5 year olds were more aware of these stereotypes than younger children (Cramer & Steinwert, 1998; Spiel et al, 2012). Between the ages of 5 to

8 years old, negative attitudes are thought to be well established (Spiel et al, 2012).

Again, adiposity has been researched extensively, but there are few studies that explore attributes children assign to muscular figures, so little is known about this or how attitudes could differ with age and gender. In research questioning adults, both men and women viewed hyper-muscular women, as compared to an average build, more negatively in characteristics such as intelligence and social popularity, but more positively on others, such as honesty (Forbes et al, 2004). The male mesomorphic (low in fatty tissue, high in muscular tissue) body types were given desirable attributes such as brave, honest and popular (Butler et al, 1993). However, there are problems with this area of research: the degree of muscularity of the figures is not always reported and few studies use female participants; less so children.

It is important to investigate the development of attitudes towards different body sizes as these attitudes can affect children's self-perceptions (Cramer & Steinwert, 1998; Neumark-Stzainer et al, 1998; Musher-Eizenman et al, 2004) and are likely to influence their beliefs around acceptable body sizes (Tiggemann & Pennington, 1990). Therefore, this research aimed to extend the attributes research based on adiposity, to incorporate muscularity, and explore attributes assigned by children to figures varying in both, to explore awareness and internalization of cultural stereotypes towards body size and shape. A further aim was to investigate the role of different factors on children's body dissatisfaction. Specifically to find out:

- How body satisfaction varies by age, BMI and gender.
- How the direction of dissatisfaction varies by age, BMI, gender and perceived body size.
- How the ideal body shape chosen varies by gender, ethnicity and perceived body size.

- The attributes assigned to figures differing in adiposity and muscularity and how this varies by age and gender.
- Which figures are chosen for positive and negative attributes.
- Which figures are chosen to be friends with, or not to be friends with.

7.2. Pilot study method

A pilot study was conducted to generate a list of attributes for figures varying in muscularity and adiposity because (to the author's knowledge) there are no studies that have used muscular figures in this type of research with children.

7.2.1. Participants

Participants were 24 girls and 24 boys aged between 9-11 years old (M = 118.37 months, SD = 11.6) randomly selected from years 5 and 6 in the school where study 2 was carried out, but who were not involved in that study. The older age groups were chosen as being the most able to articulate their ideas.

7.2.2. Materials

Eight sets of figure cards from study 2 (see details below). *Procedure:* Same sex children were invited in groups of 3 to take part in the study and consent was obtained (see chapter 4). Each group were given one set of the 5 cards (equal numbers of children from both sexes looked at each set). Each of the 5 cards showed a figure that was identical in height, but varied in body composition from the others by muscularity and adiposity and comprised of a lean/underweight, average/healthy weight, overweight/obese, muscular and hyper-muscular figure. Groups were shown one figure card at a time and asked questions about each one. Questions were asked to elicit physical, personal and social attributes as in previous stereotypes research (for example, see Lerner & Korn, 1972). Children were asked:

- ***What words can you use to describe this figure?***
- *Prompts: Which words describe what they look like?*
- *What do you think their personality is like?*

- *What sorts of things do you think they do?*
- *Can you describe how they are with other people?*
- *Is there anything else you would like to say about them?*

All attributes identified were listed on a sheet of paper by the researcher. Children were read these and asked if they thought they described the character well. Additions were made if the children suggested them. Attributes were listed for each figure card and the list was scrutinised by the researcher and synonyms removed.

It was anticipated the attributes for the figures varying in adiposity would be similar to those used in body size (weight) stereotypes research (see Lerner & Korn, 1972), and some of the attributes assigned to the figures varying in muscularity could be the same as those used in this research (for example, strong-weak). Attributes were paired with their opposite, so for example strong was paired with weak, kind with mean. A total of 6 pairs of the most reoccurring attributes were selected to represent figures varying in adiposity and muscularity (see full list Appendix 10).

7.3. Main study method

Detailed explanation of the general methodology and procedure can be found in chapter 4.

7.3.1. Participants

Participants were 148 children (equal numbers of boys and girls), in four age categories: 4-5 years (N = 34, M = 65.8, SD = 4.4), 6-7 years (N = 38, M = 85.3 months, SD = 5.5), 8-9 years (N = 38, M = 105.6 months, SD = 7.4), 10-11 years, (N = 38, M = 131.1 months, SD = 6.6). Using GPower software it was calculated that a sample size of 136 (17 boys and 17 girls in each age category) is sufficient for a 2x4x5x2 mixed measures design. Children were recruited from an ethnically diverse primary school in the UK and were predominantly working class and Pakistani (Pakistani 36.5%, White British 20.3% Gypsy Roma 11.5%, White Eastern European 7.4%, White and any other Asian 4.1%, Kurdish 3.4%,

Other Black African 3.4%, Other 13.4%). BMI centiles ranged from 0-100 (M = 52.8, SD = 31.2).

7.3.2. Materials

Four sets of 5 (Asian and Caucasian) child (girl, boy) picture cards from study 2 were used. Each of the 5 cards showed a figure that was identical in height, but varied in body composition from the others by muscularity and adiposity and comprised of a lean/underweight, average/healthy weight, overweight/obese, muscular and hyper-muscular figure (see figure 4.3 and appendix 6 for the full range).

A story book containing an illustration and text about 6 different scenarios was made. The text was based around the 6 pairs of attributes generated for the figures in the pilot study. The story task was seen as a good method for assessing body size attitudes in yielding consistent results (Cramer & Steinwert, 1998).

For example, a picture of a tree fallen across the path was shown with the text: *Two boys were playing in the woods when they came across part of a fallen tree blocking their path. They would have to move the tree otherwise they would need to turn around and walk back the way they had come. They knew there were some good trees to climb further down the path, so they didn't want to go back yet. One of the boys tried to move the tree. He pulled on one of the branches, but it was no good it was just too heavy for him. It didn't move a bit. Before they decided to turn back, the other boy said he would have a go. He grabbed one of the branches and slowly managed to pull the tree out of the way so that there was a small gap they would be able to squeeze through...*

Children were read the story and asked to select two of the figures they thought the story was about. For example, the researcher read the story about a character being strong and one being weak, the child was asked to pick the figure card which they thought showed the strong character and then the weak character or vice versa (order counterbalanced).

7.3.3. Procedure

The task consisted of three counterbalanced conditions, condition 1: Questions about the self including the child's perceived 'current' and perceived 'ideal' body size; condition 2: Attributions task; condition 3: Questions about friendship selection.

Children were taken to the test area and before the task their height and weight was measured and Body Mass Index (BMI) calculated.

7.3.3.1. Condition 1: Perceived current and ideal body size (see chapter 4: section 4.3.3.2).

7.3.3.2. Condition 2: Attributions

Children were presented with a random arrangement of 1 set of the cards matching the child's own sex and ethnicity. The researcher read the storybook and asked questions appropriate to the scenario being described.

Children were asked:

- *Which character do you think is the* strong person in *the story?*
- *Which character do you think is the* weak person in *the story?*

This was repeated throughout the story. The number of the card was recorded on the record sheet. Children were asked *why* they had made their selection, but did not need to respond if they did not wish to. A voice recorder unobtrusively recorded children's verbal responses.

7.3.3.3. Condition 3: Friendship selection

Children were presented with a random arrangement of 1 set of the cards matching the child's own sex and ethnicity placed on the table in front of them. They were asked:

- *Can you choose **one** child you would like to play with and have as your friend?*
- *Can you choose **one** child you would not like to play with and have as your friend?*

The number of the card was recorded on the record sheet. Children were asked *why* they had made their selection, but did not need to respond if they did not wish to.

7.3.4. Statistical analyses

Body satisfaction/dissatisfaction and direction of dissatisfaction: 2(gender: male x female) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by 2(body choice: actual x ideal body) mixed design ANCOVA with repeated measures on the body choice factor and BMI as a covariate.

Ideal self: 2(gender: male x female) by 5(ideal self: hypermuscular x athletic muscular x lean x normal weight x overweight) by 2(age: 4-7 years x 8-11 years) by 5(Ethnicity: Pakistani (n=55) x White British (n=30) x Gypsy Roma (n=17) x White Eastern European (n=11) x Other (n=35)) mixed design ANCOVA with BMI centile as a covariate.

Attributions and friendship selection: 2(gender: male x female) by 2(age: 4-7 years x 8-11 years) by 5(body size) mixed design MANCOVA with BMI as a covariate.

7.4. Results

7.4.1. Child responses for current perceived body size

The mean child rating for current perceived body size was 3.28 (SD = 1.1). 24.3% of the children (n = 36) reported that they looked most like the muscular figures, 19.6% (n = 29) the leanest figure, 48.6% (n = 72) the normal weight figure and 7.4% (n = 11) the overweight figure.

7.4.2. Body satisfaction

The mean discrepancy index scores (see table 7.1) indicated that boys and girls within all age groups showed dissatisfaction with their body size.

An ANCOVA was performed using the discrepancy score to investigate if there were any interactions between gender, age and BMI centile. Using gender and

Table 7.1 - Discrepancy scores and direction scores by gender and age group

			Boys		Girls	
			Discrepancy score	**Direction score**	**Discrepancy score**	**Direction score**
		N	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Age group	**4-5**	**17**	1.88 (1.27)	-0.59 (2.24)	0.94 (1.14)	-0.35 (1.46)
	6-7	**19**	1.47 (1.17)	-1.26 (1.41)	1.00 (0.94)	-0.47 (1.31)
	8-9	**19**	1.47 (1.07)	-1.26 (1.33)	0.95 (0.71)	-0.42 (1.12)
	10-11	**19**	1.58 (1.35)	-1.47 (1.47)	0.74 (0.73)	-0.63 (0.83)
	Total score	**74**	1.59 (1.20)	-1.16 (1.63)	0.91 (0.88)	-0.47 (1.17)
% dissatisfaction (N = 74)			75.7% (N = 56)		63.5% (N = 47)	

age as fixed factors and BMI centile as a covariate there was a significant effect for Gender, $F(1,8) = 16.38$, $p < .0001$, but not Age ($p > .05$) or BMI ($p > .05$). Boys had a higher mean body discrepancy score than girls and a higher percentage of boys than girls were dissatisfied with their body (see Table 7.1).

Examination of the discrepancy between self and ideal ratings revealed that 60.7% of the boys and 45.9% of the girls wanted to be leaner and/or more muscular, 24.3% boys and 36.5% girls desired to stay the same, and 15.0% boys and 17.6% girls wanted to be heavier and/or have less muscle.

7.4.3. Direction of dissatisfaction

The direction score indicated whether the child desired muscularity or adiposity. Depending upon the current body size selected and the magnitude of the discrepancy score, a negative direction score indicated the dissatisfaction in the direction of wanting to be leaner and, or more muscular. A positive direction score indicated the child wanted to be less muscular and, or have more body fat. The mean direction scores (see table 7.1) were negative indicating overall children wanted to be leaner or more muscular. For both genders the 10-11 year old age group had the largest mean direction score indicating the desire for a more lean and/or muscular body and the 4-5 year old age group had the lowest mean direction score. Generally, as girls and boys got older their direction score increased which suggested a desire towards leaner and/or more muscular figures, with the exception of 6-7 year old girls who were slightly more dissatisfied than the 8-9 year old girls. The boys had the largest total mean direction score indicating a greater desire for muscularity.

Using an ANCOVA controlling for BMI centile to investigate the direction score, there was a significant effect of Gender, $F(1,8) = 8.52$, $p < .05$, where boys were picking significantly more muscular figures than girls. No effect of Age ($p > .05$) or BMI was observed ($p > .05$).

There was also a significant effect of the child's perceived current body size on the direction score, for boys, $F(1,4) = 13.06$, $p < .001$ and girls, $F(1,4) = 7.65$, $p < .001$. Looking at the direction and size of the direction score (see table 7.2) boys within all current body size groups desired a more muscular body with the exception of those already muscular who had the lowest score, indicating they did not want to change. This is not the same for girls; girls who perceived their bodies as muscular wanted to be less muscular. Leaner girls had a direction score of 0 indicating they wanted to stay the same and normal weight and overweight girls wanted to be leaner. Children who perceived their bodies as overweight had a larger dissatisfaction score than other groups, in the direction of wanting to be leaner for girls and more lean and muscular for boys.

Table 7.2 - Descriptive statistics for direction scores for each perceived current body type

Gender	**Current body type**	**Mean direction score (SD)**
Boys	Muscular	-0.04 (1.02)
	Lean	-0.57 (1.65)
	Normal weight	-2.09 (1.25)
	Overweight	-2.40 (1.82)
	Total	**-1.16 (1.63)**
Girls	Muscular	0.62 (1.04)
	Lean	0.00 (1.07)
	Normal weight	-0.87 (0.91)
	Overweight	-1.33 (1.37)
	Total	**-0.47 (1.17)**

7.4.4. Ideal self

A significant gender difference in the body boys and girls chose as ideal $F(1, 138) = 12.08$, $p < .01$, was found. The mean rating for the boy's ideal self was 1.95 (SD =1.28) (see table 7.3), with 75.7% of boys naming one of the muscular figures (54.1% hypermuscular and 21.6% athletic muscular) as an ideal, 13.5%

naming the healthy weight figure, 5.4% naming the lean figure, and 5.4% naming the overweight figure as an ideal (see figure 7.1, page 133). The mean for the girl's ideal self was 2.99 (SD = 1.05) (see table 7.3), with 39.2% naming the healthy weight figure, 32.4% naming one of the muscular figures (10.8% hypermuscular and 21.6% athletic muscular), 27.0% naming the lean figure, and only 1.4% naming the overweight figure as an ideal (figure 7.1).

Table 7.3 - Descriptive statistics for ideal self-scores for each perceived current body type

Gender	**Perceived current body type**	**Mean ideal self score (SD)**
Boys	Hypermuscular	1.73 (1.01)
	Athletic muscular	1.42 (0.52)
	Lean	2.43 (1.65)
	Normal weight	1.91 (1.25)
	Overweight	2.60 (1.82)
	Total	**1.95 (1.28)**
Girls	Hypermuscular	2.00 (0.71))
	Athletic muscular	2.38 (1.19)
	Lean	3.00 (1.07)
	Normal weight	3.13 (0.91)
	Overweight	3.67 (1.37)
	Total	**2.99 (1.05)**

There was also a significant effect of the child's perceived current body size on the figure picked as an ideal $F(4,138) = 3.46$, $p < .05$. Examination of the effect using the Bonferroni post hoc test revealed a significant difference in ideal figure choice between the children who rated their current body size as overweight and hypermuscular $p < .05$, and overweight with athletic muscular $p < .05$, but not between the other current body sizes $p > .05$. Boys who rated their current body size as hypermuscular had a mean ideal self rating of 1.73 (SD = 1.01) (see table 7.3) and athletic muscular 1.42 (SD = 0.52) and so

wished to remain muscular. Boys whose perceived body size was overweight had a mean ideal self-rating of 2.60 (SD = 1.82) suggesting they desired a physique between the muscular and lean.

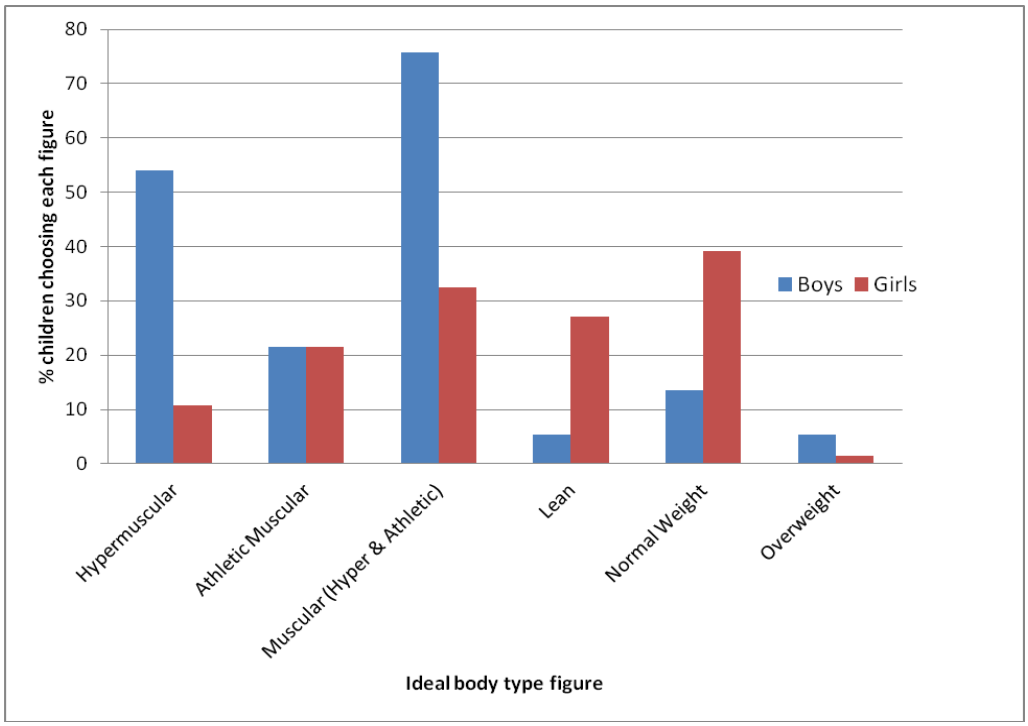


Figure 7.1 - Percentage of children choosing each figure type as their ideal body. *Note: The muscular category combines the hypermuscular and athletic muscular body types into one group to show a combined muscular choice.*

A different pattern was revealed for girls. Girls whose perceived body size was hypermuscular had a mean ideal self-rating of 2.00 (SD = 0.71) (see table 7.3) suggesting they desired a less 'hyper' muscular, but more athletic muscular physique. Girls rated as athletic muscular had a mean ideal self-rating of 2.38 (SD = 1.19) suggesting they desired a physique that was between muscular and lean. Girls whose perceived body size was overweight had a mean ideal self-rating of 3.67 (SD = 1.37) and so desired a physique between normal weight and lean.

No effect of age, BMI or ethnicity was observed ($p > .05$). In terms of ethnicity the mean ideal figure chosen by the boys revealed a muscular choice for all groups. Although the girls' ideal figure choices did not differ significantly between the ethnic groups, mean scores revealed that the Gypsy Roma girls

chose a figure higher in adiposity and lower in muscularity than other groups and towards the normal weight figure, whereas the other groups chose a figure between the athletic muscular and lean figure.

7.4.5. Attributions and friendship selection

A MANCOVA was performed with age and gender as fixed factors and BMI centile as a covariate. Reporting Pillai's trace, analysis showed a significant effect of attributions and friendship selection for Gender, $F(1,14) = 5.12$, $p < .001$ and Age $F(1,14) = 4.88$, $p < .001$, but not BMI ($p > .05$). A Bonferroni post hoc was used to examine the effects.

7.4.5.1. Attributions and gender

7.4.5.1.1. Hardworking

No significant gender difference in the figure boys and girls labelled as hardworking ($p > .05$) was found, although boys and girls did differ in their figure choices for this attribute. The mean score for boys was 2.47 (SD = 1.40) and girls 2.86 (SD = 1.21) (see table 7.4). 39.2% boys chose the hypermuscular figure as hardworking, (see figure 7.2, page 135) and this was the most popular choice for boys, compared to 21.6% girls (figure 7.3, page 135). 32.4% girls chose the normal weight figure, which was their most popular choice, compared to 20.3% boys.

7.4.5.1.2. Strong

A significant gender difference in the figure boys and girls chose as strong $F(1,143) = 6.62$, $p < .05$, was found. The mean score for boys was 2.11 (SD = 1.78) and girls 1.51 (SD = 1.20) (see table 7.4). Boys picked a narrower range of figures for this attribute, with 70.3% choosing the hypermuscular, 2.7% the athletic muscular and 27.0% the overweight figure as being strong (see figure 7.2). No boys picked the lean or normal weight figures. 79.7% girls also picked the hypermuscular figure as strong (figure 7.3).

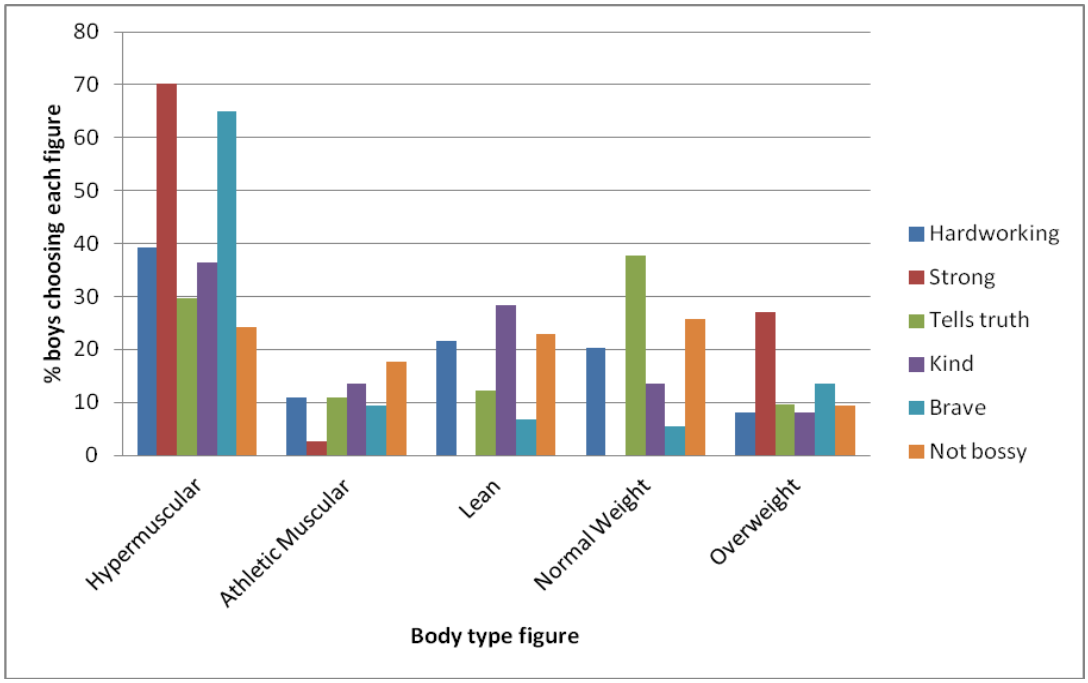


Figure 7.2 - Percentage of boys choosing each body type figure per positive attribute

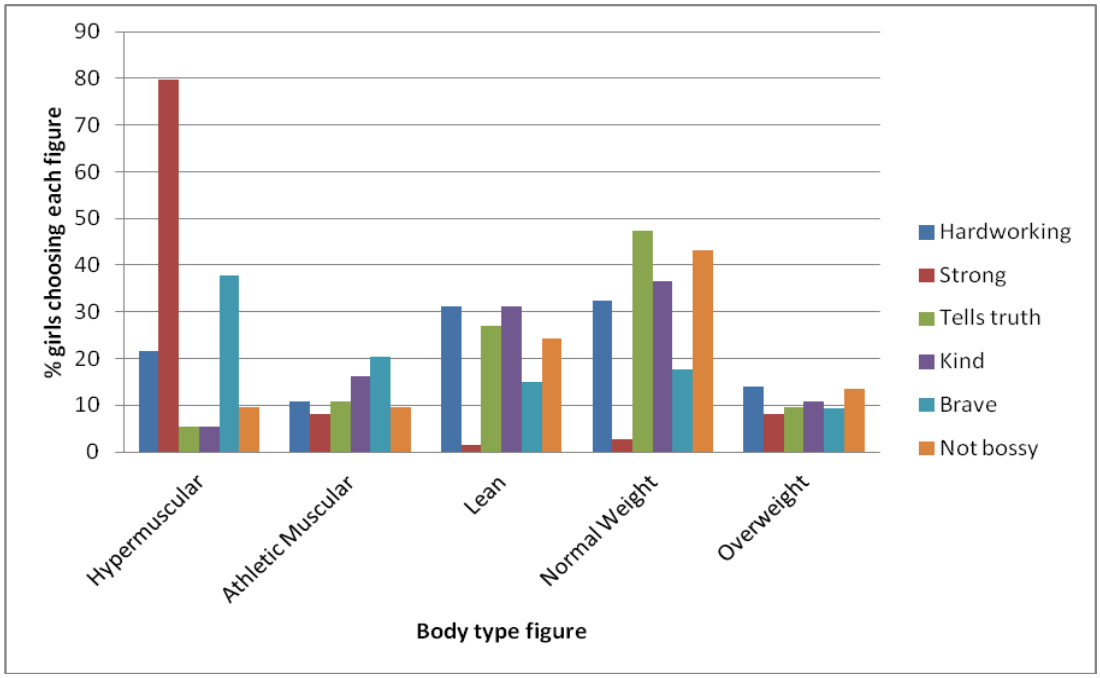


Figure 7.3 - Percentage of girls choosing each body type figure per positive attribute

Table 7.4 - Mean value of figure chosen for attributes and friendship

Attributes	**Boy (n = 74) Mean (SD)**	**Girl (n = 74) Mean (SD)**	**4-7 year olds (n = 72)**	**8-11 year olds (n = 76)**
Hardworking	2.47 (1.40)	2.86 (1.21)	2.61 (1.36)	2.72 (1.28)
Lazy	4.39 (1.16)	4.24 (1.32)	4.35 (1.19)	4.29 (1.29)
Strong	2.11 (1.78)	1.51 (1.20)	2.38 (1.82)	1.28 (0.96)
Weak	3.28 (0.82)	3.65 (0.90)	3.60 (1.00)	3.34 (0.72)
Tells the truth	2.86 (1.44)	3.45 (1.00)	3.01 (1.33)	3.29 (1.20)
Tells lies	3.55 (1.56)	3.22 (1.55)	3.74 (1.47)	3.05 (1.57)
Kind	2.43 (1.33)	3.31 (1.05)	2.72 (1.30)	3.01 (1.23)
Mean	3.65 (1.57)	3.50 (1.68)	3.81 (1.55)	3.36 (1.67)
Brave	1.93 (1.47)	2.41(1.39)	2.26 (1.52)	2.08 (1.38)
Coward	3.53 (1.14)	3.50 (1.08)	3.54(1.13)	3.49 (1.09)
Bossy	3.51 (1.67)	3.34 (1.76)	3.82 (1.52)	3.05 (1.81)
Not bossy	2.78 (1.33)	3.42 (1.14)	2.72 (1.36)	3.46 (1.08)
Friendship selection				
Play with/ be friends with	2.20 (1.38)	3.32 (.98)	2.68 (1.28)	2.84 (1.36)
Not play with/ be friends with	4.00 (1.41)	3.73 (1.74)	4.14 (1.38)	3.61 (1.73)

7.4.5.1.3. Tells the truth

A significant gender difference in the figure boys and girls chose as tells the truth $F(1, 146) = 7.62$, $p < .01$, was found. The mean score for boys was 2.86 (SD = 1.44) and girls 3.45 (SD = 1.00) (see table 7.4). 37.8% boys (see figure 7.2) and 47.3% girls (figure 7.3) chose the normal weight figure for tells the truth, but the second highest choice differed with 29.7% boys choosing the hypermuscular figure, as compared to 5.4% girls choosing this, but 27.0% girls choosing the lean figure, with only 12.2% boys choosing this.

7.4.5.1.4. Kind

A significant gender difference in the figure boys and girls chose as kind $F(1, 146) = 19.33$, $p < .001$, was found. The mean score for boys was 2.43 (SD = 1.33) and girls 3.31 (SD = 1.05) (see table 7.4). 36.5% boys viewed the hypermuscular figure as kind (see figure 7.2), as compared to only 5.4% girls (figure 7.3), but 36.5% girls viewed the normal weight figure as kind compared to 13.5% boys.

7.4.5.1.5. Brave

A significant gender difference in the figure boys and girls chose as brave $F(1, 146) = 4.45$, $p < .05$, was found. The mean score for boys was 1.93 (SD = 1.47) and girls 2.41 (SD = 1.39) (see table 7.4). 64.9% boys (see figure 7.2) and 37.8% girls (figure 7.3) picked the hypermuscular figure as brave.

7.4.5.1.6. Not bossy

A significant gender difference in the figure boys and girls chose as not bossy $F(1, 146) = 10.39$, $p < .01$, was found. The mean score for boys was 2.78 (SD = 1.33) and girls 3.42 (SD = 1.14) (see table 7.4). More girls than boys picked the normal weight figure as not bossy with 43.2% girls (see figure 7.3) compared to 25.7% boys picking this figure (figure 7.2).

7.4.5.1.7. Lazy

No significant gender difference in the figure boys and girls labelled as lazy ($p > .05$) was found. The mean score for boys was 4.39 (SD = 1.16) and girls 4.24 (SD = 1.32) (see table 7.4). The overweight figure was picked by most children as being lazy with 73.0% of boys and 70.3% of girls choosing this figure (see figures 7.4 and 7.5, page 138).

7.4.5.1.8. Weak

A significant gender difference in the figure boys and girls chose as weak $F(1, 146) = 6.33$, $p < .05$, was found. The mean score for boys was 3.28 (SD = .82) and girls 3.65 (SD = .90) (see table 7.4). The lean figure was picked by most children as being weak with 70.2% of boys (see figure 7.4) and 59.4% girls (figure 7.5) choosing this figure.

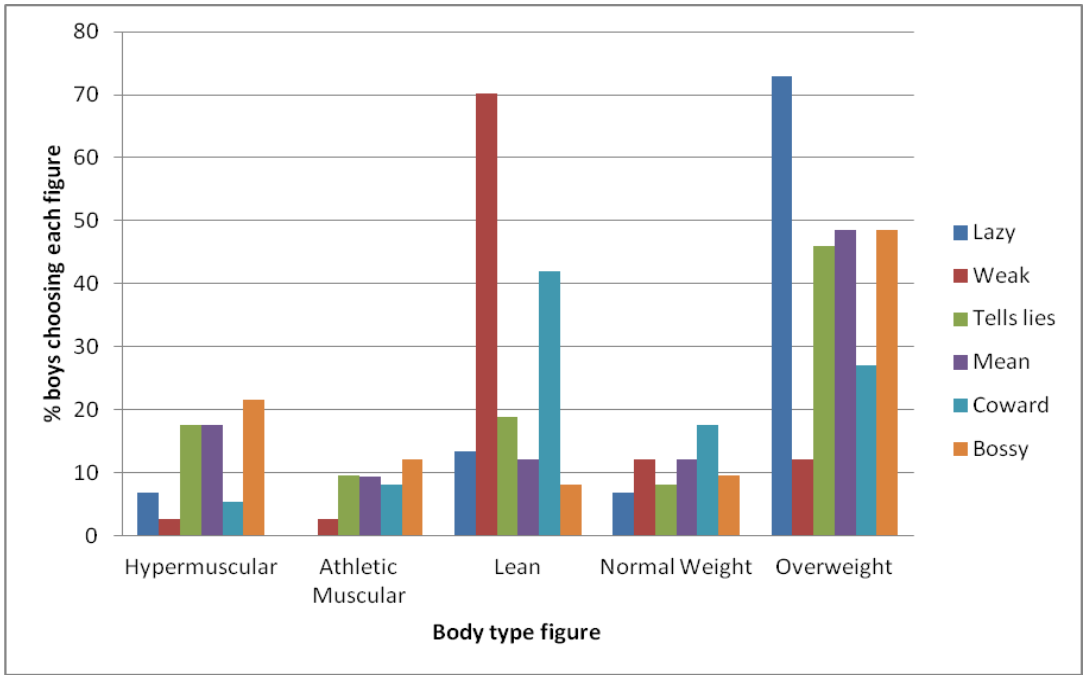


Figure 7.4 - Percentage of boys choosing each body type figure per negative attribute

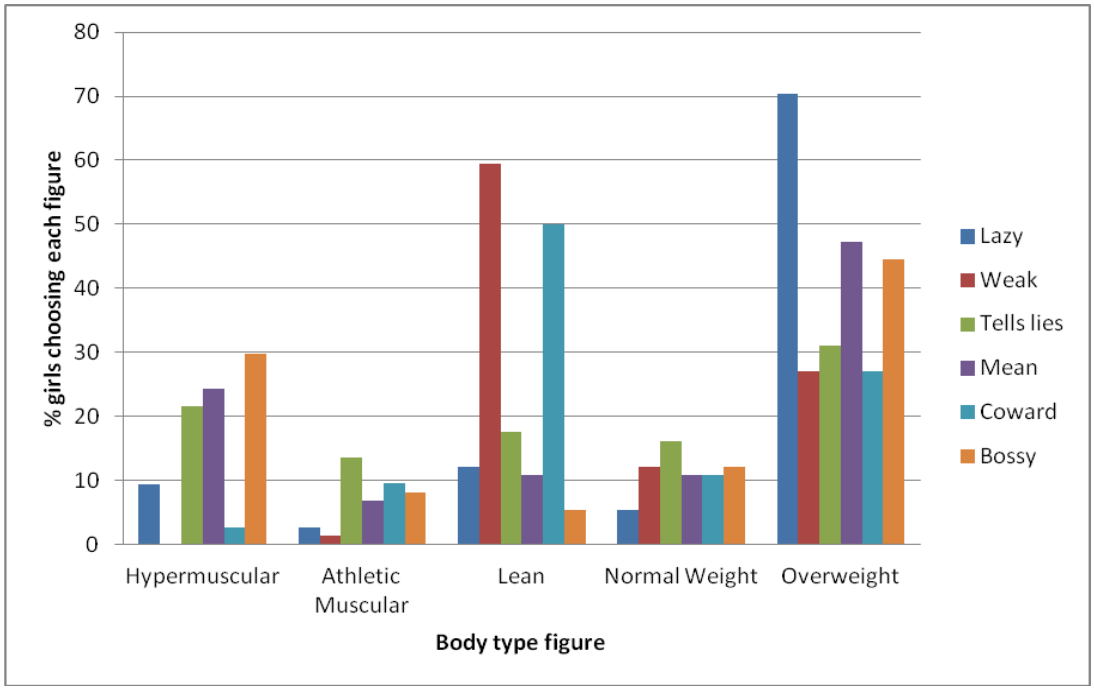


Figure 7.5 - Percentage of girls choosing each body type figure per negative attribute

7.4.5.1.9. Tells lies

No significant gender difference in the figure boys and girls labelled as tells lies ($p > .05$) was found. The mean score for boys was 3.55 (SD = 1.56) and girls 3.22 (SD = 1.55) (see table 7.4). The overweight figure was picked by most children as being the one that tells lies with 45.9% of boys (see figure 7.4) and 31.1% girls (figure 7.5) choosing this figure.

7.4.5.1.10. Mean

No significant gender difference in the figure boys and girls labelled as mean ($p > .05$) was found. The mean score for boys was 3.65 (SD = 1.57) and girls 3.50 (SD = 1.68) (see table 7.4). The overweight figure was picked by most children as being the one that is mean with 48.6% of boys and 47.3% girls choosing this figure (see figures 7.4 and 7.5). The second highest choice was the hypermuscular figure with 17.6% boys and 24.3% girls choosing this one.

7.4.5.1.11. Coward

No significant gender difference in the figure boys and girls labelled as a coward ($p > .05$) was found. The mean score for boys was 3.53 (SD = 1.14) and girls 3.50 (SD = 1.08) (see table 7.4). The lean figure was picked by most children as being the one that was a coward with 41.9% of boys and 50.0% girls choosing this figure (see figures 7.4 and 7.5). The second highest choice was the overweight figure with 27.0% boys and girls choosing this one.

7.4.5.1.12. Bossy

No significant gender difference in the figure boys and girls labelled as bossy ($p > .05$) was found. The mean score for boys was 3.51 (SD = 1.67) and girls 3.34 (SD = 1.76) (see table 7.4). The overweight figure was picked by most children as being the one that is bossy with 48.6% of boys and 44.6% girls choosing this figure (see figures 7.4 and 7.5). The second highest choice was the hypermuscular figure with 21.6% boys and 29.7% girls choosing this one.

7.4.5.2. Friendship selection and gender

7.4.5.2.1. Play with and be friends with

A significant gender difference in the figure boys and girls chose as the figure they would play with and be friends with $F(1, 146) = 31.77$, $p < .001$, was found. The mean score for boys was 2.20 (1.38) and girls 3.32 (.98) (see table 7.4). More boys than girls picked the hypermuscular figure as the one they would want to play with and be friends with, 45.9% boys compared to only 6.8% girls picked this figure (see figure 7.6). More girls than boys picked the normal weight figure as the one they would want to play with and be friends with, 54.1% girls compared to 14.9% boys picked this figure.

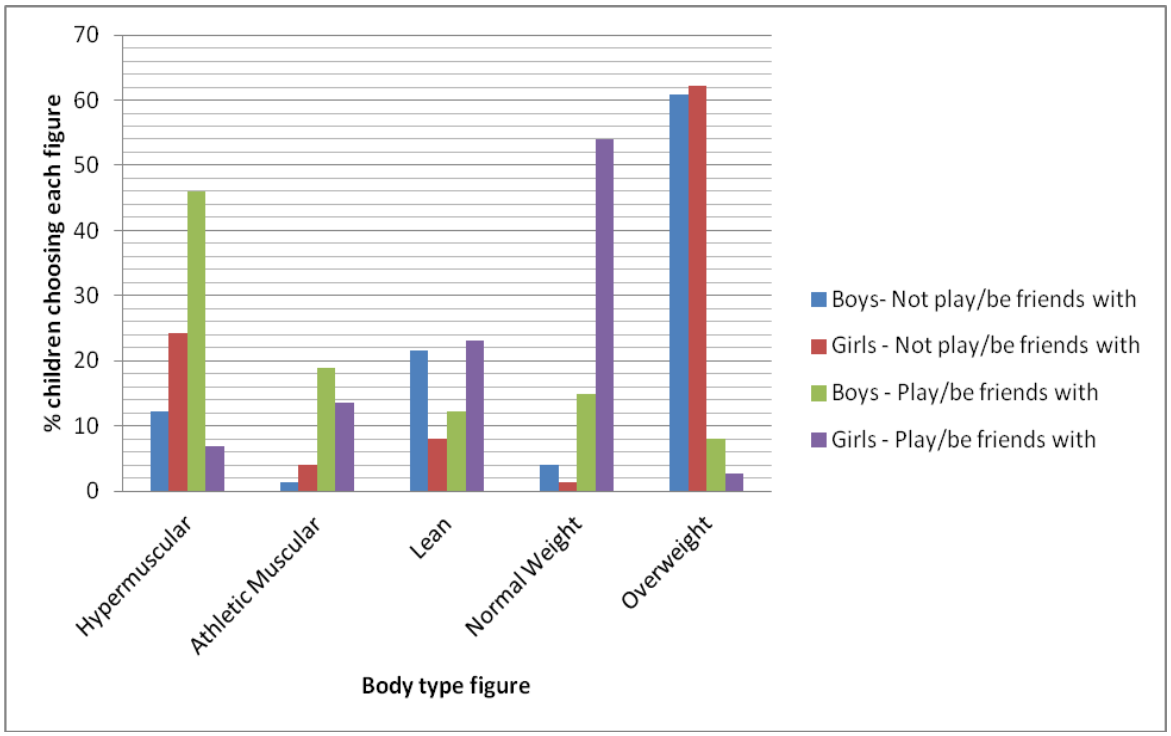


Figure 7.6 - Percentage of children choosing each figure type as the one they would and would not play with and be friends with

7.4.5.2.2. Not play with and be friends with

No significant gender difference in the figure boys and girls labelled as the one they not want to play with and be friends with ($p > .05$) was found. The mean score for boys was 4.00 (1.41) and girls 3.73 (1.74). The overweight figure was picked by most children as being the one that they would not play or be friends with 60.8% of boys and 62.2% girls choosing this figure (see figure 7.6). The

second highest choice differed between boys and girls with 21.6% boys choosing the lean figure as compared to 8.1% girls choosing this, but 24.3% girls choosing the hypermuscular figure, with only 12.2% boys choosing this.

7.4.5.3. Attributions and friendship selection and age

No significant difference in the figure the younger children compared to the older children labelled as hardworking, lazy, weak, tells the truth, kind, mean, brave, coward or play with/be friends with ($p > .05$) was found (see table 7.4).

7.4.5.3.1. Attributions and age

7.4.5.3.1.1. Strong

A significant difference between the figure the two age groups chose as the figure who is strong: $F(1,43) = 21.18$, $p < .001$, was found. The mean score for the children aged 4-7 years old was 2.38 (1.82) and aged 8-11 years old was 1.28 (0.96) (see table 7.4). 90.8% of the older children viewed the hypermuscular figure as strong, as compared to 58.3% of the younger children. 30.6% of the younger children also chose the overweight figure as strong.

7.4.5.3.1.2. Tells lies

A significant difference between the figure the two age groups chose as the figure who tells lies: $F(1,43) = 8.25$, $p < .01$, was found. The mean score for the children aged 4-7 years old was 3.74 (1.47) and aged 8-11 years old was 3.05 (1.57) (see table 7.4). 50% of the younger children viewed the overweight figure as the one who tells lies, as compared to 27.6% of the older children. 27.6% of this age group also chose the hypermuscular figure as the one who tells lies as compared to 11.1% of the younger children.

7.4.5.3.1.3. Bossy

A significant difference between the figure the two age groups chose as the figure who is bossy: $F(1,43) = 6.12$, $p < .05$, was found. The mean score for the children aged 4-7 years old was 3.82 (1.52) and aged 8-11 years old was 3.05 (1.81) (see table 7.4). 54.2% of the 4-7 year old children chose the overweight figure as being bossy, as compared to 39.5% of the 8-11 year old children.

36.8% of the older children also chose the hypermuscular figure compared to 13.9% of the younger children.

7.4.5.3.1.4. Not bossy

A significant difference between the figure the two age groups chose as the figure who is not bossy: $F(1,43) = 13.51$, $p < .001$, was found. The mean score for the children aged 4-7 years old was 2.72 (1.36) and aged 8-11 years old was 3.46 (1.08) (see table 7.4). 42.1% of the older children chose the normal weight figure and 23.7% lean as the ones that are not bossy. This differs from 29.2% of the younger children who picked the hypermuscular and 26.4% who picked the normal weight figures for this attribute.

7.4.5.3.2. Friendship selection and age

A significant difference between the figure the two age groups chose as the figure who is the one they do not want to play with and be friends with: $F(1,43) = 4.77$, $p < .05$, was found. The mean score for the children aged 4-7 years old was 4.14 (1.38) and aged 8-11 years old was 3.61 (1.73) (see table 7.4). 66.7% of the 4-7 year old and 56.6% of the 8-11 year old children chose the overweight figure as the one they did not want to play with. Second choices varied with 12.5% of the younger children not wanting to play with the lean figure and 26.3% of the older choosing the hypermuscular.

7.5. Discussion

Key findings:

- Males had higher body dissatisfaction than females.
- Boys wanted to be muscular and girls wanted to be lean.
- The pattern of assigning positive attributes was gendered.
- Boys viewed the hypermuscular figure the most positively and girls the normal weight and lean figures the most positively.
- Both boys and girls viewed the overweight figure the most negatively.

This study replicated some of the findings from the previous two studies where body dissatisfaction was demonstrated in children at an early age, there were significant gender differences in body satisfaction and boys reported a higher body dissatisfaction than girls. The overall pattern of dissatisfaction showed boys wanted to be muscular and girls lean, which followed a gendered pattern of ideal preferences based on societal ideals of desirable body shapes and sizes for males and females (see Tiggeman, 2011a, for example).

Furthermore, over three quarters of the boys aged 4 to 11 years old desired the muscular figures as an ideal, with over half picking the hypermuscular figure. The desire for boys to increase their muscularity is supported by research using questionnaire methods (Ricciardelli et al, 2006; McCabe et al, 2007). The girl's ideal figure choices differed to the boys, with the normal weight figure being preferred by just over a third of girls. Almost a third of the girls chose the muscular figures, with two thirds of these picking the athletic muscular one. In addition, just over a quarter of the girls chose the lean figure. Research supports the findings of girl's preferences for a leaner physique (Schur et al, 2000; Truby & Paxton, 2002; McCabe et al, 2007) and an interest in becoming more muscular (Ricciardelli et al, 2003; McCabe et al, 2006), although, as a scale incorporating muscularity has not been used in this published research (it used the questionnaire method), it is difficult to say whether the findings reported are directly comparable to those found in the current study.

Being overweight is not desirable in Western society (see Musher-Eisenman et al, 2003) and the findings in the current study confirm that young children were aware of this. Out of this sample just one girl (aged 4 to 5 years old) and four boys (aged 4 to 7 years old) picked the overweight figure as an ideal body, which is a much lower figure than reported by other research (see Ricciardelli & McCabe, 2001; Truby & Paxton, 2008). None of the older children in the current study picked an overweight figure as an ideal self and this may reflect an increasing awareness developing in the children that having a higher adiposity is not desirable or deemed acceptable (Cramer & Steinwert, 1998; Musher-Eisenman et al, 2003; Spiel et al, 2012). This awareness could develop earlier

for girls. Indeed, girls between the ages of 3 to 5 years old have expressed a preference for very thin bodies (Davison et al, 2000; McCabe et al, 2007; Harriger et al, 2010), or rate an underweight figure more favourably than boys do (Brylinsky & Moore, 1994). The awareness of the stigma of being overweight is also highlighted by the finding that children who perceived themselves as overweight in the current study were the least satisfied with their bodies, thus suggesting a child's self image is influenced by their perceived and not actual body size (Holub, 2008).

However, some research has shown that more boys than girls pick the overweight figure as an ideal body shape, as also found in the current study. The suggestion is that boys could be viewing the overweight figure as having bulk and confusing this with muscularity (see Cohane & Pope, 2001; Brann, 2010). In the attribute task in the current study, just under a third of the younger children chose the overweight figure for the *strong* attribute, suggesting there could be confusion around strength, muscularity and adiposity for younger children. Nevertheless, it should be noted that far fewer boys chose an overweight figure as an ideal in the past three studies than in other published research (see Schur et al, 2000; Truby & Paxton, 2002; Brann, 2010) and so indicates that our scale assessing both muscularity and adiposity is allowing boys to make muscular choices, and as a result is giving a more accurate picture of body shape ideals for children.

Interestingly, there was not a significant gender difference between the figures picked for negative attributes, with the exception of 'weak'. Both boys and girls viewed the overweight figure as being lazy, tells lies, mean and bossy. Most children saw the lean figure as weak and a coward, but the overweight figure was the second choice for these negative characteristics as well. The overweight figure was also picked as the one the children did not want to play with and be friends with. This friendship rejection and assignment of negative characteristics to the overweight build is consistent with published findings (Brylinsky & Moore, 1994; Cramer & Steinwert, 1998; Musher-Eizenman et al, 2004; Spiel et al, 2012) and reflects the general stereotyping around being

overweight in our society. Some published research reveals gender differences, with girls demonstrating more negative attitudes towards overweight figures (Holub, 2008) and greater preference for underweight figures (Brylinsky & Moore, 1994). However, the current study found little difference in negative attitudes towards overweight figures between boys and girls as demonstrated in other research (see Cramer & Steinwert, 1998; Tiggemann & Wilson-Barrett, 1998; Tiggemann & Anesbury, 2000) and so cannot elucidate the role of gender on these negative attitudes further.

It has been suggested that negative attitudes towards overweight builds develop during the preschool years (Cramer & Steinwert, 1998; Spiel et al, 2012) and there was evidence of these attitudes with the youngest children aged four years old in the current study. Research supports the continued development of these attitudes from 4 to 11 years old (Wardle et al, 1995), and between the ages of 5 to 8 years old, negative attitudes are thought to be well embedded (Spiel et al, 2012). In contrast, the current study found that on some attributes, the older children (aged 8 to 11 years old) were less negative towards the overweight figure than the younger children (aged 4 to 11 years old). For example, more of the younger than older children, chose the overweight figure as bossy and tells lies.

Moreover, the younger children picked the overweight figure more often as the child they did not want to play with and be friends with. This is an interesting finding and could be due to the wider range of experiences the older children have, such as they may play with overweight friends and realise that overweight peers do not share these stereotypical negative attributes. Some research has found no age effect on negative stereotyping (Tiggemann & Wilson-Barrett, 1998) or a greater acceptance of overweight figures developing in late adolescence or adulthood (Rand & Wright, 2000; Latner et al, 2005). The author of the current research proposes that this could start earlier, perhaps in late childhood, and could warrant further investigation. However, it should be noted that, although some older children were less negative in their attitudes towards

overweight individuals, they did not desire this body shape as an ideal for themselves.

The pattern of assigning positive attributes was gendered and this seemed to align with the stereotypical Western societal ideals for desirable body sizes for male and female bodies (Grogan & Richards, 2002; Tiggeman, 2011a), where males were choosing muscular bodies and females lean. There was a significant difference between the figures boys and girls picked for all the positive attributes, with the exception of 'hardworking' where choices also differed for boys and girls, but did not reach significance. For boys, the figure picked the most often for positive attributes and so viewed the most positively, was the hypermuscular figure. This figure was seen as being hardworking, strong, kind, brave and the one the boys would choose to play with and be friends with. It was also picked by the boys as the second highest choice for 'tells the truth' and 'not bossy', behind the normal weight figure choice. Research with adults found the highly muscular figure being rated as brave, honest and popular (Butler et al, 1993). Assigning positive attributes to the hypermuscular figure indicated that boys in the current study viewed this figure positively in terms of physical, personal and social characteristics that they may hope to acquire. Attitudes held about the different figures could have influenced the boys' beliefs around acceptable body sizes (as suggested by Tiggemann & Pennington, 1990) and could help to explain why over half of the boys in this study chose the hypermuscular figure as their ideal body.

Girl's choices differed to boys, with the exception of the strong and brave attributes, where girls also picked the hypermuscular figure. Interestingly for hardworking, tells the truth, kind, not bossy and who they would play with and be friends with, the normal weight figure was the highest choice and lean second. With the hardworking and kind attributes the choice was split closely between these two figures. This suggested that girls viewed the normal weight and lean figures the most positively in terms of physical, personal and social characteristics and this was borne out in their ideal body choice, where over a

third of the girls picked the normal weight figure as an ideal self and just over a quarter the lean figure.

In addition, the hypermuscular figure was not viewed as positively by the girls as it was by the boys and more girls than boys attributed the figure as mean, bossy, lazy and tells lies. It was also picked as the second highest choice of figure they did not want to play with and be friends with. In research with adults, hypermuscular women were rated more negatively in characteristics than men (Forbes et al, 2004). The girls' assignment of negative attributes to the hypermuscular figure and viewing it negatively on personal and social characteristics could offer an explanation as to why some girls did not desire muscularity or wanted a less muscular physique. Results from the current study showed that the girls who perceived their current body size as muscular wanted to be less muscular. Specifically, hypermuscular girls wanted to have the athletic muscular physique and girls who perceived themselves as athletic muscular wanted a physique that was between the muscular and lean figures. This could be due to an awareness of the stereotypes around the amount of acceptable muscle for females, where too much muscle is not deemed feminine or desirable (Dworkin, 2001; Hobson, 2002; Forbes et al, 2004; Grogan et al, 2004), but looking lean and physically fit is appealing (Forbes et al, 2004; Tiggemann, 2011a). Interestingly, a fifth of boys and girls in this study desired the athletic muscular physique, which may be more attractive to girls than the bulkier figure. Being lean was also desirable for the girls and findings revealed that if girls perceived their current body as lean, they wanted to stay lean. If they perceived their bodies to be normal weight or overweight, they wanted to be leaner. Being lean was important for the girls in this study, as found in published research (Shapiro et al, 1997; Truby & Paxton, 2002; Dion, 2016).

In contrast to other research where around 17%-30% of boys desired a leaner figure, a very small number of boys in this study chose the lean body as an ideal (for example see Schur et al, 2000; Ricciardelli & McCabe, 2001; Smolak, 2002; Ricciardelli et al, 2006). The boys viewed the lean figure negatively, attributing it with being weak and a coward, and it was the second choice for a

figure that tells lies. It was also picked as the second highest choice of figure that boys did not want to play with and be friends with, following the overweight choice. Although not directly investigated in this study, there could be cultural differences in attitudes towards lean figures. It was noted during the task that some of the Gypsy Roma and Pakistani boys commented that the lean figure looked ‘poor’, ‘does not have a job’, and ‘would not get a wife’. Research in this area is limited, so further investigation is required. The boys’ assignment of negative attributes to the lean figure and viewing it negatively on some physical, personal and social characteristics, similarly to the girls’ view of the hypermuscular figure, could offer an explanation as to why over 86% of the boys chose an ideal figure as one other than the lean figure.

7.5.1. Conclusions

The main purpose of this study was to explore how negative and positive attributes were assigned to figures differing in adiposity and muscularity. It found that children as young as 4 years old were able to assign 6 pairs of attributes about a person, and evaluate friendship preference, to a figure based purely on body appearance. Results showed the pattern of assigning positive attributes was gendered and aligned with the stereotypical societal ideals of males attaining a more muscular body and females leaner. The assignment of positive attributes to the hypermuscular figure by the boys, or normal weight and lean figures by the girls, suggested that these figures were viewed the most positively by children in terms of physical, personal and social characteristics and could offer an explanation for the different ideal body choices boys and girls made.

The pattern of assigning negative attributes to figures differing in adiposity and muscularity was similar for boys and girls. The overweight figure was picked by the majority of the children for negative physical, personal and social characteristics. These results were consistent with published findings and reflected the general stereotyping of being overweight in Western society. This was evident in children as young as four years old in this study.

7.5.2. Future directions for research

Body size stereotyping seems to be the foundation from which children internalise beliefs about different sized bodies and internalise the thin ideal, and this can lead to the development of body dissatisfaction in some children (Blowers et al, 2003; Spiel et al, 2012). Messages about what males and females should look like are reaching children at a very young age. Future studies need to focus on the possible early influences on the formation of these attitudes towards figures varying in muscularity and adiposity and to explore whether this could be due to sociocultural influences: parents, the media and toys.

Therefore, areas for further study are:

- To investigate which of the parental factors (such as parental body satisfaction, perception of the child's current figure, choice of ideal figures, encouragement to control weight, develop muscles and engage in exercise) measured predict children's body satisfaction, children's ideal figure choice and future adult figure choice, and parent's choice of ideal figure for the child and child as a future adult.

- To look at which of the media influence factors (child's exposure to toys and media) and exercise factors (householders engagement in exercise, child's awareness of householders engagement in and reasons for exercise) predict children's body satisfaction, children's ideal figure choice and future adult figure choice, and parent's choice of ideal figure for the child and child as a future adult.

- To find out if the results replicate those found in studies 1-3, so to further examine some of the factors (age, gender, perceived body size) on body satisfaction, the direction of dissatisfaction and ideal body choice.

- To measure body composition, rather than BMI, and examine this as a factor in the development of body satisfaction, the direction of dissatisfaction and ideal body choice.

Chapter 8

Investigating sociocultural (media and parental) influences on boys' body satisfaction and desire for a muscular body:

8.1. Introduction

The previous three studies showed that body dissatisfaction was demonstrated in children at an early age, boys reported a higher body dissatisfaction than girls and there were significant gender differences in body satisfaction. The overall pattern of dissatisfaction revealed boys wanted to be muscular and girls lean and this followed a gendered pattern of ideal preferences based on sociocultural ideals of desirable body shapes and sizes for males and females (see for example Thompson et al, 1999; Forbes, et al, 2004; Tiggeman, 2011a and chapter 2 for further discussion).

In study 3, the positive and negative attributes assigned to figures differing in adiposity and muscularity were explored to help elucidate why the children made the ideal body choices they did. The pattern of assigning positive attributes was gendered, where boys assigned more positive attributes to the hypermuscular figure, and girls the normal weight and lean figures. These figures were viewed the most positively by the children in terms of physical, personal and social characteristics and thus were desirable as an ideal. Indeed, the same figures were chosen as an ideal, hypermuscular for the boys and normal weight or lean for the girls. Interestingly, boys and girls assigned the negative attributes similarly and both chose the overweight figure the most often for the negative characteristics, such as being lazy, the one that tells lies and the one they did not want to play with (as supported by research by Brylinsky & Moore, 1994; Cramer & Steinwert, 1998; Musher-Eizenman et al, 2004; Spiel et al, 2012). These findings reflect the general stereotyping of being overweight in our society (Puhl & Brownell, 2006; Puhl & Latner, 2007).

The previous studies in this thesis showed that messages around ideals about how bodies should look in terms of the amount of body fat and/or muscle for male and female bodies have been transmitted to even the youngest children.

This awareness could have influenced the children's choices of an ideal figure for the self and led to a preference for particular body shapes and sizes developing at a young age. It is suggested that body size stereotyping is the foundation from which children absorb beliefs about different sized bodies and internalise the thin ideal, and this can lead to children developing dissatisfaction with their own bodies (Blowers et al, 2003; Spiel et al, 2012).

This study aims to explore the early influences on the formation of these attitudes. It proposes to examine some of the factors influencing boys' desire to have a hyper-muscular or muscular physique, which may indicate why these figures are chosen as body ideals and why the hyper-muscular figure is assigned more of the positive attributes by boys. Boys are the focus of this investigation because there is a lack of research conducted with preadolescent boys and the effects on their body image of exposure to muscular idealised images (Humphreys & Paxton, 2004; Mulgrew et al, 2014).

The sociocultural theory helps explain how messages from the mass media, family and peers about appearance ideals are transmitted to the individual, internalised and influence body satisfaction if a person feels they do not measure up to the ideal (Tiggemann, 2011a; 2012, and see chapter 2 for a discussion). As sociocultural influences are not well researched with preadolescent children, or findings from some studies are mixed (Ricciardelli et al 2000; Tiggemann, 2012), the effects of these factors on young boys' body image warrants further investigation.

8.1.1. Masculinity and the media

Children spend a considerable amount of time each week interacting with the media such as the internet and TV (Harringer, 2012). Different types of media may be used by boys to construct their masculinity, such as print media and TV programs (for example, see Hust, 2006; Halim et al, 2013). Being masculine is associated with strength and muscularity for men (Gough & Robertson, 2010) and superheroes in particular depict ideal masculinity with their typically masculine characteristics of being powerful, strong and assertive with a hyper-

muscular body type (Baker & Raney, 2007; Gough & Robertson, 2010). Superhero characters found in comic books, books, TV programmes, cartoons and films are aimed at young male audiences and spin off merchandise, including action figures and dressing up clothes, are directly marketed at children. Messages around masculinity, the behaviours and appearance associated with being masculine and a man, may be transmitted via this media to children, particularly boys. Media specifically aimed at children, replicates the sociocultural ideals transmitted to adults (Tiggemann, 2012), for instance Herbozo et al, (2004) found media such as children's videos reinforced stereotypes around beauty and specific body sizes and included muscular male or thin female characters.

Furthermore, young boys are frequently exposed to the superhero images. It was found that a quarter of 3 to 6 year old boys watched a superhero program each week (see Coyne et al, 2014). Coyne et al's (2014) study did not include the amount of time children engaged with other superhero media, such as playing with figures or reading comics, so superhero exposure is likely to be more frequent. Although not studying effects on body image, the study showed that exposure to watching superhero characters on TV influenced young children's behaviour. 3 to 6 year old girls and boys who frequently watched superhero programs demonstrated more male-stereotyped play and weapon play, thus showing how children can be influenced by the strong messages around masculinity being communicated.

8.1.2. The media and body image

Boys and girls are exposed to different types of media which present idealized images of men and women, such as through TV adverts, music videos, fashion, sports and fitness magazines and the various types seem to impact on boys' and girls' body image differently. For example, appearance focused TV endorsing the thin ideal, had a negative effect on the preadolescent and adolescent girl's body image, which sometimes persisted for up to two years (Hargreaves & Tiggemann, 2002; 2003; 2004; Dohnt & Tiggemann, 2006; Harrison & Hefner, 2006). However, TV adverts portraying the muscular ideal,

did not affect the body image of the adolescent boys viewing them (Hargreaves & Tiggemann, 2004; Humphreys & Paxton, 2004). Similarly with print media, 6 to 12 year old boys and girls viewed objectified images of (strong, muscular) men and (thin, sexy) women taken from the internet and magazines (Murnen et al, 2003). Although both responded positively to the images of their gender, girls responded more strongly to objectified images of women than boys did to men, and there was a stronger relationship between the girl's response, awareness of the cultural ideal and internalization of media images, and body esteem. However, with a different media, such as music videos, viewing music TV negatively affected body image for both boys (Mulgrew et al, 2014) and girls (Anschutz et al, 2009a) (see chapter 2 for a full review).

8.1.3. Dolls and action figures

In Western culture, the ideal male body has become much more muscular over time and this physique has been mirrored in children's action figures which have increased considerably in muscularity over the past 30 years (Pope et al, 1999). Toys may expose children to appearance ideals and provide a role model conveying standards of appearance, personality and behaviour which children internalize during play (See Mead, 1934 and chapter 2 for further discussion). The impact of exposure to muscular action figures on body image is not well researched with boys, but university students handling extreme muscular figures demonstrated decreased body esteem (Barlett et al, 2005) and preadolescent and adolescent boys wanted to look like the hypermuscular action figures presented, despite recognising the physiques were not normal (Baghurst et al, 2007).

8.1.4. Dressing up clothes

Make-believe play is important for young children's development and dressing up in costumes and assuming the role of different characters helps them develop physically, socially and emotionally and improves language and cognitive skills (see Lindsey & Colwell, 2003; Johnson et al, 2005 and chapter 2 for further discussion). Superheroes dominate popular media for boys and many boys in particular enjoy engaging in superhero play (Parsons & Howe, 2006)

which can help them develop a sense of mastery over their environment (Kostelnik, 1986). The impact of dressing up clothes on children's body image has not been studied to date (to the author's knowledge), but many superhero characters display a physique displaying unattainable muscularity (Baghurst et al, 2007) and many superhero action costumes aimed at boys have extra padding to give the wearer a muscular physique. Superhero costumes are a popular choice for boys. Figures show they were the second most popular costume to wear at Halloween with princess costumes being the most common (Statisticbrain.com, no date). Costumes and boys action figures have been found to display gender-stereotyped characteristics reinforcing masculinity, because they display hyper-muscularity, for instance (Murnen et al, 2016). There seems to be a narrow range of costumes aimed at boys with an over emphasis on the muscular body shape. An investigation into the effect of regularly dressing up in such costumes and the impact on body satisfaction is needed.

8.1.5. Family influences

The family are known to be an important influence on a child's body image because they transmit societal messages about appearance ideals. Within the sociocultural framework, the child's family can influence body image via two main mechanisms: *modelling theory* where children internalize the indirect messages given out from their family members around a standard for acceptable body image; and *active influences* where the messages are directed at them about their physical appearance and can be perceived as positive or negative regardless of intention (Rogers, 2012). The impact of body related messages from parents needs to be clarified, parents giving positive encouraging messages about controlling weight and shape are a strong predictor of weight or muscle concerns in boys and girls (Helfert & Warschburger, 2011). In contrast, mothers transmitting messages around body shape and size were largely positive, contributing to body satisfaction (Ricciardelli et al, 2000). Although, in the same study, messages from their mothers about eating less food and from fathers about exercising more, led to

the boys adopting body change strategies (Ricciardelli et al, 2000). (See chapter 2 for a full discussion).

8.1.6. Parental involvement in sport and body image

There is much research around the benefits of involvement in exercise. For adults a review of the literature showed those exercising had improved psychological functioning and body image (Kirkcaldy & Shephard, 1990; Berger & Motl, 2000; Reed & Ones, 2006). This was also true for adolescents where exercisers experienced enhanced self-image and improved physical and psychological wellbeing (Kirkcaldy et al, 2002). However, what seems understudied is the impact that parental involvement in exercise has on their child's body image. If modelling theory posits that family members' model body image for children through their attitudes and behaviours, this could be true of their modelling of, or attitudes towards exercise. This is of interest to the current study because many boys in the previous 3 studies described how male members of their family were engaging in exercise to build muscle and this appeared to be influencing their choice of ideal figure towards a hypermuscular or athletic muscular figure.

8.1.7. Parental body dissatisfaction

The relationship between parental weight concern and body dissatisfaction and their child's body dissatisfaction is not clear. Some studies show a relation between mother's weight concerns or body dissatisfaction and their child's body dissatisfaction (Smolak et al, 1999; Wertheim et al, 1999; Brown & Ogden, 2004; Keery et al, 2006). In contrast, other studies show that the parent's own body dissatisfaction ratings and evaluation of their child's body image and eating behaviour were not related (Striegel-Moor & Kearney-Cooke, 1994). Nor was the child's *perception* of their mother's weight concern related to the child's body dissatisfaction (Anschutz et al, 2009b). Moreover, girls and boys with mothers who showed higher body dissatisfaction, were less likely to assign negative characteristics to a larger figure (Spiel et al, 2012). It seems that some parents can hold a negative view of their body without it affecting their child's body image.

The current research focused on boys aged 4 to 11 and their parents and aimed to understand the sociocultural influences on boys' choice of ideal body and body satisfaction and to investigate the role of different factors on children's body dissatisfaction.. Specifically to find out:

- Whether the findings replicated some of those from studies 1 to 3: How body satisfaction and the direction of dissatisfaction varies by age and body composition; How the direction of dissatisfaction varies by perceived body size; How body satisfaction differs over three body parts (torso, arms, legs); How the ideal body shape chosen for the self and future adult self varies by age.

- Which of the factors measured (see factors listed in the analysis section) predict children's body satisfaction, children's ideal figure choice, children's future adult figure choice, and parental choice of ideal figure for the child and child as a future adult.

8.2. Methods

This study was in 2 parts. Part 1 required parents to complete a questionnaire. Part 2 involved the male children of the parents who completed the questionnaire to take part in a task in school. Detailed explanation of the general methodology and procedure can be found in chapter 4.

8.2.1. Participants

8.2.1.1. Children

Participants were 29 male children aged between 4 and 11 years old and were divided into two age categories for part of the analysis: 4-7 years (M = 75.4, SD = 9.3), 8-11 years (M = 116.0 months, SD = 12.5). Children were recruited from the reception school year up to year 6 from two primary schools in the UK and were predominantly middle class and White British: (88.7% White British, 6.9% White & Black Caribbean, 3.4% Indian). BMI centiles ranged from 0-98 (M = 50.5, SD = 31.5). Muscle mass 11.4 Kg- 39.3 Kg (M = 20.7, SD = 6.6), Body fat 10.6% - 32.2% (M = 18.6, SD = 4.8).

8.2.1.2. Parents

Participants were 29 adults (25 female and 4 male), aged between 25-64 years old whose children attended the above primary schools and were predominantly middle class and White British: (93.1% White British, 3.4% White & Black Caribbean, 3.4% Indian). BMI ranged from 17.5 – 41.8 (M = 25.5, SD = 5.7).

8.2.2. Materials

8.2.2.1. Jigsaw for children

A Body Parts Satisfaction Jigsaw comprising of 7 torsos, 7 pairs of arms, and 7 pairs of leg pieces which varied in muscularity from no muscles to hyper-muscular, or differed in adiposity from underweight to obese was used (see figure 4.4).

8.2.2.2. Cross-sectional questionnaire for parents

(See Appendix 11)

Section 1: Parental perception of child's actual, ideal and future adult ideal figure: Child scale (see figure 4.4): The parent was presented with 7 figures of a child varying in adiposity and muscularity and was asked to pick the figure they perceived to be the closest to their child's actual body shape and the figure they perceived to be the one they would like as their child's ideal body shape. The figures were numbered 1-7; with number 1 for the most 'bulky' hyper muscular figure. Figures decreased in 'muscular bulk' to figures 2-3. Figure 2 was the more 'athletic' muscular figure and with figure 3 had less muscle mass and was a lean muscular figure. Figure 4 was very lean and with less muscle and figures 5-7 increased in adiposity and decreased in visible muscularity. The difference between the actual and ideal pairs of numbers (the discrepancy index) was calculated**.**

Adult scale (see figure 4.6): The parent was presented with 7 figures of an adult varying in muscularity and adiposity. They were asked to pick the figure that best represented the ideal body shape they would want for their child when they became an adult aged approximately 20 years old. The figures were numbered 1-7 (as the child figures above).

Parents were asked to choose how they considered their child's weight and muscularity to be, from a choice of 3 options scored 1-3: For weight the choices were: underweight (1), right weight (2), overweight (3): For muscularity: not muscular enough (1), the right amount of muscle (2), too muscular (3). Using a five-point scale from 'strongly disagree' scored as 1 to 'strongly agree' scored as 5, parents rated the extent to which they agreed with the statements about their child's current desire for muscularity and desire to be thinner. They also rated the extent to which they (as parents) currently encouraged their child to take part in physical activity, eat less to control weight and increase their muscle size, using the five-point scale.

Section 2: Toys and other media: Parents were asked to select the action figures and dressing up costumes their child had owned and played with and the ages that they played with them. These were counted separately, so for example, a total number of toys owned was scored. 11 figures could be ticked and others suggested by the parents. If those suggested represented a muscular 'human like' figure they were added to the total score. To determine the frequency of exposure to muscular toys and other media portraying muscular characters parents were asked questions around how often their child played with or watched the media. They responded to a five-point scale, 'never/very rarely' to 'every day'. These responses were scored 1, never/very rarely to 5, very often.

Factor analysis was used to determine which media questions clustered around a factor and relevant items were combined to give a media influence score to be used in the analysis (as explained below). 9 media questions were retained for the final analysis and the media influence score ranged from 1-37.

Sections 1 and 2 (explained above) were repeated at the end of the questionnaire; parents completed an additional section if they consented for another child to take part in the study.

Section 3: Parental perception of their own actual and ideal figure: The parent was presented with 7 figures of a male and female adult varying in muscularity and adiposity (male adult scale was the same as used for child's future adult figure, see figure 4.6, for the female scale see questionnaire appendix 11). They were asked to pick the figure (of the appropriate gender) they perceived to be the closest to their own actual body shape and their ideal body shape. The figures were numbered 1-7 and scored as the adult scale described above. Parents were also asked to choose how they considered their own weight and muscularity to be, from a choice of 3 options, scored 1-3 (as explained for child's scale earlier): For weight: underweight, right weight, overweight; for muscularity: not muscular enough, the right amount of muscle, too muscular.

Section 4: About people who exercise in their family: Parents were asked to identify the people who took part in exercise from their household. If they exercised, they rated the frequency of exercise on a five point scale from 'once per month' scored as 1, to '5 or more times per week' scored as 5. They identified the type(s) of exercise they did. They also rated the reasons for exercise and responded to a five-point scale ranging from 'strongly disagree' scored as 1, to 'strongly agree' scored as 5. Parents were asked to complete the section for one other person who exercised from the household, again identifying the frequency and type of exercise and the main reason for the exercise. Finally, parents were asked 3 questions determining the child's awareness of the members of the household's engagement in exercise and reasons for exercising. They responded to a five-point scale from 'never/very rarely' scored as 1, to 'often' scored 5.

In combination with the media questions, factor analysis was used to determine which exercise questions clustered around a factor and relevant items were combined to give an influence of exercise score to be used in further analysis (as explained below). 11 exercise questions were retained for the final analysis and the influence of exercise score ranged from 0 to 47. A score of 0 was given if no one in the household exercised.

Section 5: Demographic data was collected in the final section of the questionnaire.

8.2.2.3. Factor analysis on questionnaire items

A principal component factor analysis was conducted on 28 items of the questionnaire initially (this comprised of: 5 items related to child comments about their desire for muscularity and desire to be thinner and parental encouragement for the child to control weight/develop muscles/engage in more physical activity; 9 media items, 14 exercise items) with oblique rotation (direct oblimin) to reduce the dimensions of the questionnaire to a number of common underlying factors. Rotation was used to simplify and clarify the pattern of factor loadings (Osborne, 2015). As it was expected there would be some correlation among factors, oblique rotation was used, and this method could handle both correlated and uncorrelated factors effectively (Field, 2013; Osborne, 2015). Direct oblimin was selected as an appropriate option for a dataset of this size.

This factor analysis resulted in a 'non-positive definite matrix' and so the problem variables, identified as the 5 items relating to child comments about their body and parental encouragement of activity and body change, were eliminated from the analysis. 3 exercise questions about other family members were also removed as 14 participants did not have another family member exercising in the home. 20 items (relating to media and exercise) were included and through a process of extraction using Kaiser's criterion, factors with eigenvalues of 1 or above were retained. Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .62 which was above the acceptable limit of .5 (Field, 2013). Furthermore, as was the case with this data, factors with four or more loadings greater than .6 were reliable regardless of sample size (Guadagnoli & Velicer, 1988).

An initial analysis was run to obtain eigenvalues for each factor in the data. Three factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 72.00% of the variance. The scree plot (figure 8.1) showed inflexions that would justify retaining 3 factors. We retained 2 factors because the items

loaded most highly onto the first and second factors, thus suggesting the questionnaire data had two underlying scales. Table 8.1 shows the factor-loadings after rotation. The items that clustered on the same factor suggested that factor 1 (eigenvalue 9.65) represented media influence and factor 2 (eigenvalue 3.45) influence of exercise.

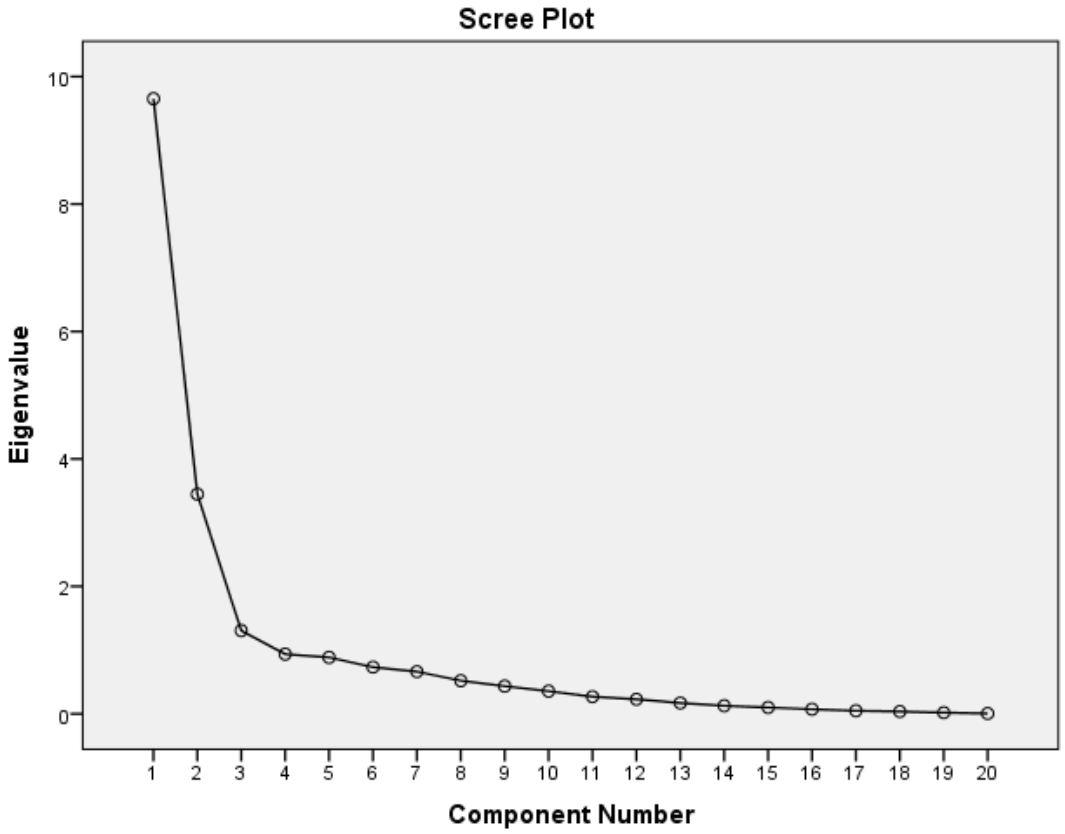


Figure 8.1 - Scree plot showing the inflexion at component 3

Table 8.1 - Summary of exploratory factor analysis results for the SPSS factors influencing body choice questionnaire (*N* = 29)

	Rotated factor loadings	
Item	Influence of exercise	Media influence
Number of toys owned	-.059	**.596**
Number of ages played with figures	.138	**.669**
How often figures played with	-.115	**.882**
How often watch TV with characters	-.163	**.730**
How often view books etc material showing characters	-.037	**.736**
How often play computer games with characters	-.616	**.204**
Number of dressing up costumes owned	-.021	**.755**
Number of ages dressed up in costumes	-.077	**.684**
How often dressed up in costumes	.153	**.659**
Number of people in household who exercise	**.687**	-.018
How often parent exercises	**.856**	.085
Number of types of exercise	**.580**	-.100
Exercises to increase fitness	**.965**	.003
Exercises to build muscle	**.802**	-.210
Exercises to lose body fat	**.942**	-.011
Exercises to control weight	**.887**	-.036
Exercises to improve performance for a sport or activity	**.855**	-.079
Exercises for other physical health benefits	**.912**	-.004
Exercises for psychological health benefits	**.970**	.006
Exercises to socialize	**.851**	.110

8.2.3. Procedure

8.2.3.1. Part 1: Parental questionnaire task

Parents with at least one boy at the school were invited to complete the questionnaire and consent to their child or children taking part in the study. 250 questionnaires with an information letter were handed out to these parents and an online link was made available via the school newsletter which was emailed to parents weekly. The newsletter detailed information about the study. Completed paper copies of the questionnaires were returned to the office for the researcher to collect. A reminder via an online text system was sent to parents at both 2 and 4 weeks after the questionnaires were handed out. Parents were also reminded about the study each week in the school newsletter for the duration of the study. 8.6% of parents responded.

8.2.3.2. Part 2: Face-to-face task with children

Children with consent to take part in the study were asked to remove their shoes and socks and stand on the Tanita body composition scales. The child's body composition was recorded.

Children were seated at the table in the test area and familiarised with the task by being asked to fit together the puppet jigsaw (Appendix 7) comprising of torso, arm, leg and head pieces following a demonstration by the researcher. The researcher presented children with the Body Satisfaction Jigsaw pieces, pointed at a selection of them and described them, for example telling the child, 'This piece has muscles, can you see where the muscles are?'

The task consisted of three counterbalanced conditions, the perceived 'current' and perceived 'ideal' self body size using the body satisfaction jigsaw (see chapter 4 for an explanation of the task) and perceived 'ideal' adult body size using the adult scale (figure 4.6).

For the perceived ideal adult body size, children were presented with 7 cards showing 7 figures of an adult varying in muscularity and adiposity arranged randomly on the table. Following the familiarisation task with the figure cards

(as chapter 4, section 4.3.2.1.) the researcher asked the child, ‘Can you point to the figure that shows how you would like to look when you are an adult at 20 years old?’ The number of the figure was recorded.

8.2.4. Statistical analysis

Study Design: The study was a cross-sectional design and used a 2(body choice: actual x ideal body) by 3(body part: Torso x pair of arms x pair of legs) by 2(age: 4-7 years x 8-11 years) mixed design with repeated measures on the body choice and body part factors.

Body satisfaction: A multivariate analysis of covariance (MANCOVA) with the perceived-ideal discrepancy score for the torso, arms and legs, with age (4-7 years x 8-11 years) as a fixed factor and body fat percentage as a covariate, was used.

Dissatisfaction over the 3 body parts: A paired samples t-test was used to compare the discrepancy scores between the torso, arms and legs.

Direction of dissatisfaction: A MANCOVA with the direction score for the torso, arms and legs, with age (4-7 years x 8-11 years) as a fixed factor and body fat percentage as a covariate, was used. To see if perceived body size had an effect on the direction score, a MANCOVA with the direction score for the torso, arms and legs, with perceived current body size for torso, arms and legs as fixed factors was executed. The Bonferroni *post hoc* test was applied to explore the relationship further.

Ideal self and ideal future adult self: A one-way ANOVA was used to determine if there was a significant difference in ideal self or ideal future adult self body choice for torso, arms and legs for younger (4-7 years old) and older (8-11 years old) boys.

A multiple linear regression was utilized with the questionnaire data to tell us which variables predict the child’s body satisfaction (the satisfaction scores from the three individual body parts were added together, child’s ideal figure choice

(the three individual body parts scores added together), child's future adult ideal figure choice, parent's choice of ideal figure for the child, parent's choice of ideal future adult figure for the child.

All appropriate variables for each of the DV's were selected and entered into the model in order of importance based on theoretical literature where relevant, as Field (2013) suggested. The forced entry method was used and the regression was repeated after statistically redundant variables were removed. The factors/predictors were: child's age group, parental body satisfaction, parental BMI, parental satisfaction with child's body, parental perception of child's current figure, parental choice of ideal figure for their child, parental choice of ideal adult figure for their child, parental encouragement for the child to control weight/develop muscles/engage in more physical activity, child's body composition, child's satisfaction score, child's ideal figure, child's ideal adult figure, child's comments about muscle and/or body fat: media influence (child's exposure to toys and media), exercise: (householders engagement in exercise, child's awareness of householders engagement in and reasons for exercise).

8.3. Results

8.3.1. Child and parent data

Parents: 22.3% of the parents perceived their current body size as muscular, 3.7% as lean, 29.6% normal weight, 37.0% as overweight and 7.4% obese. According to self reported BMI, 3.7% of the parents were underweight, 51.9% of a healthy weight, 25.9% were overweight and 18.5% obese.

Children: Children picked their current body part for torso, arms and legs and 24.1% - 37.9% perceived their body part as muscular, 20.7% - 55.2% as lean, 13.8% - 34.5% normal weight and 3.4% - 17.2% overweight or obese. Reporting the body composition measures, 10.3% of the children had low body fat under the desirable range for their age, 51.7% were within the desirable range and 37.9% had a body fat higher than the desirable range.

Bivariate correlations revealed there was no relationship between parental BMI and child's BMI centile, body fat percentage or amount of muscle p >.05.

8.3.2. Body satisfaction

Parents: 100% of the men and 78.3% of the women demonstrated body dissatisfaction. Overall 21.7% did not want to change their body (this was the women only), 74.1% desired to be more lean and/or muscular and 3.7% wanted to be less muscular and/or have more body fat. 75% of the men and 60.9% of the women chose a muscular figure as an ideal, 0% men and 4.3% women the lean figure and 25% men and 34.8% women the normal weight figure. No parents picked the overweight or obese figures as an ideal self.

Children: 58.6% of the children were dissatisfied with their arms, 75.9% with their torso and 86.2% were dissatisfied with their arms, indicating that 24.1% did not want to change their torso, 13.8% did not want to change their arms and 41.4% were satisfied with their legs. Moreover, 65.5% desired a more lean and/or muscular torso, 72.4% more lean and/or muscular arms and 51.7% more lean and/or muscular legs. 10.4% wanted to have a torso that was less muscular and/or have more body fat, 13.8% arms that were less muscular and/or with more body fat and 6.9% legs that were less muscular and/or with more body fat. The mean discrepancy scores indicated that boys within both age groups showed dissatisfaction with their body size for their torso, arms and legs. A table summarizes the results (Table 8.2).

A MANCOVA showed there was not a significant difference in satisfaction between the older boys (8-11 years old) and younger boys (4-7 years old) (p > .05), and thus older and younger boys demonstrated similar levels of body dissatisfaction for their torso, arms and legs.

Table 8.2 - Mean body part discrepancy scores, mean direction scores and percentage body dissatisfaction by age group

			Body part discrepancy scores			**Body part direction scores**		
			Torso	**Arms**	**Legs**	**Torso**	**Arms**	**Legs**
		N	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Age group	**4-7 years old**	**19**	1.26 (1.15)	2.42 (1.64)	.79 (.79)	-.84 (1.50)	-1.37 (2.63)	-.58 (.96)
	8-11 years old	**10**	1.50 (.85)	2.10 (1.52)	.70 (.68)	-1.50 (.85)	-2.10 (1.52)	-0.70 (0.68)
	Total score	**29**	1.34 (1.01)	2.31 (1.58)	.76 (.74)	-1.07 (1.33)	-1.62 (2.31)	-.62 (.86)
% dissatisfaction			75.9	86.2	58.6			
N = 29			(n = 22)	(n = 25)	(n = 17)			

8.3.3. Dissatisfaction over the 3 body parts

A paired samples t-test was used to compare the discrepancy scores between the torso, arms and legs. There was a significant difference between the discrepancy scores for the torso and arms $t(28) = -4.103$, $p < 0.001$, torso and legs $t(28) = 5.241$, $p < 0.001$ and arms and legs $t(28) = -2.489$, $p < 0.05$. These results suggest that the boys' levels of satisfaction differed over the three body parts. The boys mean direction score was higher for the arms, then torso, then legs, which indicated that boys felt the greatest dissatisfaction with their arms and least dissatisfaction with their legs (see table 8.2).

8.3.4. Direction of dissatisfaction

The direction of the dissatisfaction and what this indicated in terms of a child's desire for muscularity and, or adiposity was calculated for each of the three body parts in this study. The total mean direction scores were negative for all of the body parts which indicated the children wanted to be leaner and/or more muscular (see Table 8.2).

A MANCOVA showed there was not a significant difference in the direction of dissatisfaction between the older (8-11 years old) and younger (4-7 years old) boys ($p > .05$), thus older and younger boys were showing a similar direction of dissatisfaction for each body part.

8.3.5. Perceived body size

The direction scores showed that for all of the body parts, the children desired to be leaner and/or more muscular for each, no matter which current body size they perceived themselves to be (see table 8.3) with the exception of children who perceived their arms as already muscular, who wanted slightly less muscle and in the direction of leaner arms.

Table 8.3 - Descriptive statistics for Direction scores for each perceived current body type

	Torso	**Arms**	**Legs**
Perceived Current body type	**Mean direction score (SD)**	**Mean direction score (SD)**	**Mean direction score (SD)**
Muscular	-.43 (1.27)	.63 (2.45)	-.18 (.87)
Lean	-1.25 (1.00)	-1.83 (1.17)	-.77 (.73)
Normal weight	-.80 (1.79)	-1.90 (1.37)	-1.50 (.58)
Overweight/obese	-4.00 (0)	-4.40 (.89)	No participants
Total	-1.07 (1.33)	-1.62 (2.31)	-0.62 (.86)

There was a significant effect of the child's perceived current body size on the direction score for torso $F(6,16) = 2.82$, $p < .05$ and arms $F(9,27) = 2.59$, $p < .05$, but not for legs $p > .05$. The children who perceived themselves as overweight or obese for their torso and arms body parts, had the largest mean direction score of all the groups, in the direction of wanting to have a leaner and more muscular torso and arms (see Table 8.3).

The Bonferroni post hoc test showed that for the torso body part, the direction score was significantly different between the children who perceived their bodies as lean and those as overweight or obese. Boys who perceived their torso as already muscular or lean, desired a more muscular torso, those with normal weight torsos wanted to be lean and those overweight or obese wanted their torso to be leaner and more muscular. For the arms body part, there was a significant

difference in the direction scores between the muscular group and all other groups and the overweight/obese group and all other groups. The children who perceived their arms as muscular had the lowest direction score, in the direction of desiring less muscle, whereas those perceiving their arms as lean wanted them to be more muscular and the normal weight and overweight/obese body types wanted their arms to be leaner and more muscular.

8.3.6. Ideal figure choice: Ideal self

There was not a significant difference in the figure the younger children (4-7 years old) and older children (8-11 years old) chose as an ideal for torso, arms or legs ($p > .05$). The mean rating for the boy's ideal torso was 2.90 (SD =1.29), arms 2.62 (SD = 1.61) and legs 3.17 SD = 1.10). Boys were making very similar body shape choices for their torso and legs where 65.5% of boys named one of the muscular body parts (lean, athletic or hyper muscular) as an ideal, 31% chose the lean, 0% the healthy weight and 3.4% chose the overweight body part as an ideal torso and legs (see figure 8.2). Choices for arms differed slightly, 72.4% chose one of the muscular parts as an ideal, 13.8% the lean, 10.3% the healthy weight and 3.4% the overweight body part.

8.3.7. Ideal adult

An ANOVA showed there was no significant difference in the figure the younger children (4-7 years old) and older children (8-11 years old) chose as ideal for their future adult self ($p > .05$). However, the mean rating for the adult figure choice differed between the age groups, with the mean for the younger boys 2.84 (SD = 1.98) and the older boys 1.80 (SD = .63), thus indicating a more muscular choice. Percentages highlight the trend for older boys choosing muscular as 100% picked one of the muscular figures as an ideal future adult self. For the younger boys 68.4% picked one of the muscular figures, 5.3% lean, 15.8% normal weight and 10.6% overweight or obese (see figure 8.3).

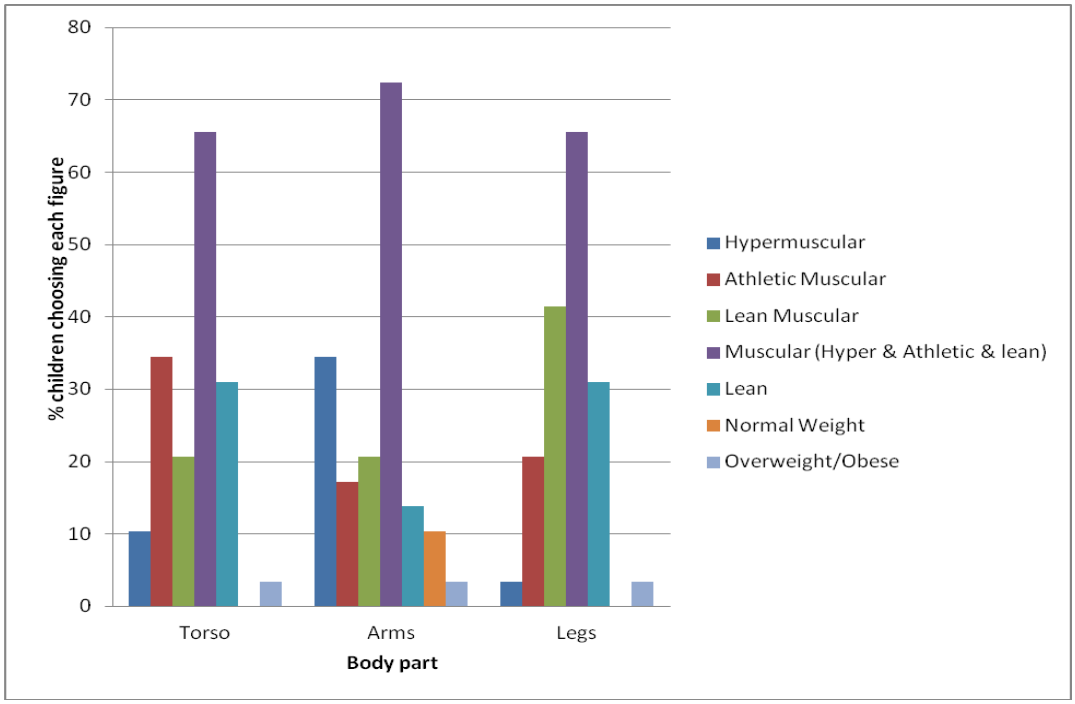


Figure 8.2 - Percentage of children choosing each figure type as their ideal body part for torso, arms and legs. *Note: The muscular category in each graph combines the hypermuscular, athletic muscular and lean muscular body types into one group to show a combined muscular choice.*

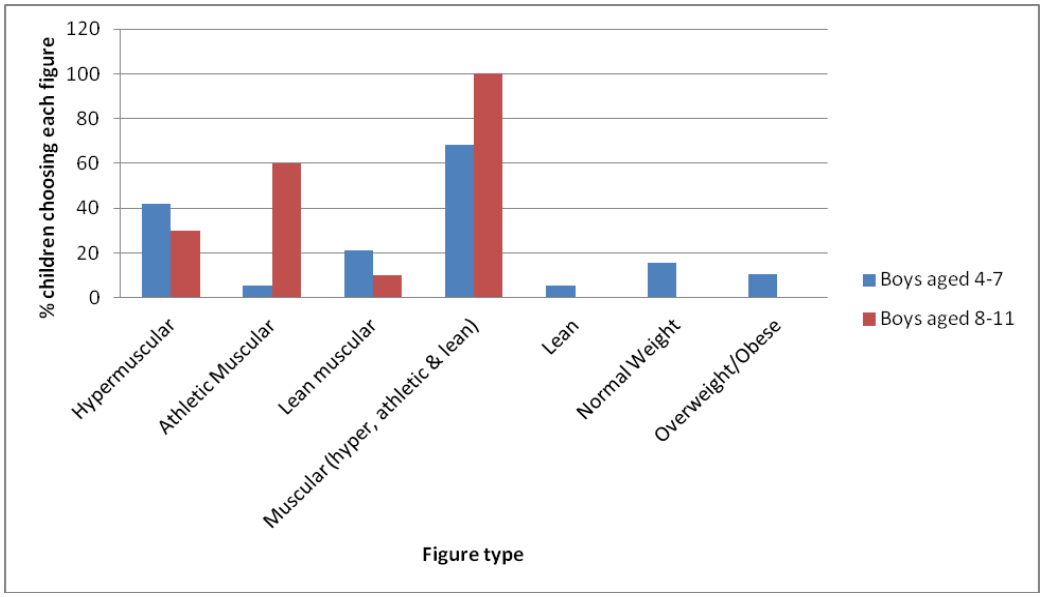


Figure 8.3 - Percentage of children within each age group choosing each figure type as their ideal adult future self

8.3.8. Factors that predict children's body satisfaction

Table 8.4 - Linear model of predictors of the Dependant variables with 95% bias corrected

DV: Child's total body satisfaction				
Model 1	b	SE B	β	*P*
(Constant)	7.60	1.73		*P* = .001
Parent's perception of child's current figure	-1.37	0.50	-.45	*P* = .004
Parent's satisfaction score	0.55	0.24	.37	*P* = .009
Note R^2 = .35 (*ps* < .01)				
DV: Child's ideal body				
Model 1	b	SE B	β	*P*
(Constant)	10.08	1.37		*P* = .001
Exposure to Media score	-0.11	0.04	-.36	*P* = .014
Future ideal	0.49	0.24	.33	*P* = .031
Note R^2 = .33 (*ps* < .01)				
DV: Child's future ideal (adult) figure				
Model 1	b	SE B	β	*P*
(Constant)	4.30	0.81		*P* = .001
Exposure to Media score	-0.76	0.29	-.38	*P* = .019
Note R^2 = .14 (*ps* < .05)				
DV: Parent's choice of ideal body for child				
Model 1	b	SE B	β	*P*
(Constant)	1.75	0.84		*P* = .000

Parent's perception of child's current figure	0.49	0.25	.660	*P* = .000
Note R^2 = .44 (*ps* < .001)				
DV: Parent's choice of ideal future (adult) figure for child				
Model 1	b	SE B	β	*P*
(Constant)	1.43	0.34		*P* = .010
Parent's ideal for self	0.44	0.16	.58	*P* = .032
Note R^2 = .34 (*ps* < .01)				

A multiple linear regression was used to predict the child's total body satisfaction. A significant regression was found: F(2,24) = 6.47, *p* <.01 with an R^2 = .35 (see table 8.4). For this model the parent's perception of their child's current figure, B = -0.45; *t*(24) = -2.73, *p* <.05; 95% CI -2.41 - -0.34 and parent's own body satisfaction B = 0.37; *t*(24) = 2.24, *p* <.05; 95% CI 0.04 – 1.05 were significant predictors of the child's body satisfaction, with parent's perception of their child's current figure being the stronger predictor. This showed that more positive parental ratings of the child's body size and parents own body satisfaction, predicted the child's body satisfaction.

Factors that predict a child's ideal body choice:

For the child's ideal body choice the regression was significant: F(2,26) = 6.49, *p* <.01 with an R^2 = .33 and showed that exposure to media score B = -0.36; *t*(25) = -2.11, *p* <.05; 95% CI -0.20 – 0.03 and choice of future ideal figure B = 0.33; *t*(25) = 1.92, *p* <.05; 95% CI 0.11 – 0.89 were equally strong significant predictors of the child's ideal body choice (see table 8.4). Children who were exposed to more media, were more likely to pick the ideal figures for the self that were towards the lean and more muscular range of figures. Children's choice of child ideal is related

to their choice of future ideal figure, so those picking increasingly more muscular figures for the self, were also picking these figures for their future adult self.

Factors that predict a child's future adult ideal body choice:
For the child's future ideal body choice as an adult a multiple linear regression was significant: F(1,27) = 4.46, p <.05 with an R^2 = .14 and revealed that the exposure to media score B = -0.38; t(25) = -2.11, p <.05; 95% CI -0.13 - -0.02 was a significant predictor of the child's future adult ideal body choice (see table 8.4). Children who were exposed to a greater amount of media, picked the future ideal figures that were towards the lean and more muscular range of figures.

Factors that predict a parent's choice of ideal body for the child: The regression model was significant: F(1,27) = 20.88, p <.001 with an R^2 = .44 and showed that parent's perception of the child's current figure B = 0.66; t(25) = 4.57, p <.001; 95% CI 0.27 – 0.71 was a significant predictor of the parent's ideal body choice for the child (see table 8.4). This indicated that the parent's perception of their child's current figure influenced their choice of ideal figure for their child in a positive direction, and the parent chose similar body size figures for the child's current figure as the ideal body figure.

Factors that predict a parent's choice of ideal future adult body for the child: For the parent's choice of future adult body ideal for the child the regression model was significant: F(1,25) = 12.55, p <.01 with an R^2 = .34 and indicated that the parent's choice of ideal figure for the self B = 0.58; t(25) = 3.54, p <.01; 95% CI 0.12 – 0.74 was a significant predictor of the parent's ideal body choice for child as an adult (see table 8.4). This suggested that the parents chose similar body size figures for their child as an adult as they would as an ideal for themselves.

8.4. Discussion

Key findings:

- A high number of boys were dissatisfied with their bodies and body dissatisfaction developed at a young age for some boys.
- Boys desired muscularity for all of their body parts.
- Parent's body satisfaction and their perception of their child's current body size, predicted child's body satisfaction and thus were important factors in the development of a child's body image.
- Exposure to media predicted the child's ideal and future ideal adult figure choices.

Consistent with the findings of the previous three studies, a large number of boys were dissatisfied with their bodies or body parts and the use of the Body Parts Satisfaction Jigsaw and other scales developed enabled this to be demonstrated in children as young as 4 years old. Body dissatisfaction was also evident with the parents, where 100% of the men and 78.3% of the women reported some dissatisfaction with their bodies. However, it must be noted that our sample size was small and therefore not very representative of the population. A review of literature from the US showed that body dissatisfaction varied greatly in adults with between 11%-72% of women and 8%-61% of men showing some dissatisfaction with their bodies (Fiske et al, 2014).

The current research aimed to explore the link between parental and child body dissatisfaction and found that parental body satisfaction predicted child's body satisfaction. This relationship was positive, where as the parent's dissatisfaction with their bodies increased, child's dissatisfaction with theirs did also. This is supported by research which found a significant correlation between the parent and child for measures of body dissatisfaction (see Hall & Brown, 1982; Brown & Ogden, 2004) and weight concern (Steiger et al, 1994). Parental body

dissatisfaction is an important factor in the development of a child's body image, also seen to impact on children's attitudes, where children with parents who demonstrate high body dissatisfaction show greater negative body size stigmatization (Rich et al, 2008).

As a large number of the parents demonstrated body dissatisfaction in this study, it was possible the negative view parents held around their own bodies had impacted on how the children think and feel about their own bodies and thus could have affected their body image. This would be consistent with a *modelling theory* of parental influence, where parents' attitudes and behaviours towards their own or others' bodies, model a family standard for what is an acceptable body image, which is internalised by the child and used to construct their own body image (Rogers, 2012). According to Social Comparison Theory (Festinger, 1954) family members set standards of appearance for social comparisons and if the child compares themselves with how they think they should look, as per the messages transmitted by their parents, and feel they did not measure up to the acceptable body image, they could become dissatisfied with their own bodies and develop a negative body image, as seen with adolescent boys and girls (Botta, 2003; Hargreaves & Tiggemann, 2004).

Alternatively, children who showed body dissatisfaction (measured by the discrepancy between ideal and current figure choices) may have been susceptible to choosing what they perceived to be the socially accepted body shape for a boy, as they could have felt pressured to choose the 'correct' figure choice (as suggested by Brown & Slaughter, 2011). It is difficult to know whether the children genuinely desired these figures as an ideal for their own bodies, or simply wished to make a 'correct' choice, but what it does show is through picking the muscular choices as an ideal, boys were aware of the stereotypical idealised body shape ideals for males (see for example, Thompson & Cafri, 2007), and this awareness has developed at a young age. As discussed in chapter 2, an awareness of body ideals does not mean the children have internalised the ideals as a personal

preference for their body shape at this age (Thompson & Stice, 2001; Harriger et al, 2010). However, it is likely to influence their understanding of the body sizes that are acceptable in society (Tiggemann & Pennington, 1990) and these ideals of body shape and size greatly influence body dissatisfaction (Grogan, 1999; Bergstrom & Neighbors, 2006).

Consistent with the past 3 studies were the body ideals the boys chose. Again 65.5% - 72.4% of boys desired the muscular body parts, over three quarters choose a muscular adult future self and three quarters of the fathers also chose a muscular ideal. This reflected a pattern of ideal preferences based on societal ideals of desirable body shapes and sizes for males (see chapter 2 for discussion). Interestingly 60.9% of the mothers also chose one of the muscular figures as an ideal-self, thus revealing that some females are interested in having a muscular physique (Ricciardelli et al, 2003; McCabe et al, 2006). The parent's choice of ideal figure for their own body predicted their choice of adult figure for the child. The relationship was positive, so parents' making increasingly more muscular choices for the self as an ideal, made more muscular choices for the child's ideal. Furthermore, the child's ideal choice as a child predicted their choice of future adult figure in a positive direction, so children making more muscular choices for the ideal self, made more muscular choices for their future adult ideal. Again, these findings highlighted the importance of muscularity for males and showed that boys were aware of the pressure to conform to the prescribed mesomorphic body shape as a younger and older male (Barlett et al, 2008).

One aim of this study was to investigate the effects of the perceived pressure from parents on boys to adopt behaviours that could align their body size with the male ideal. *Active influences* from parents were explored. This is where children directly receive messages related to their physical appearance, which can be perceived as positive or negative regardless of intention and can affect body image (Rogers, 2012). This was examined in the current study through the messages parents gave to encourage the child to build muscle, eat less food to lose weight, or engage in

more physical activity. In contrast to the results of other studies (see Ricciardelli et al, 2000; Helfert & Warschburger, 2011), there was no positive or negative impact of these messages on the child's body satisfaction in this study. Interestingly *'parental encouragement to build muscle'* initially predicted the child's choice of ideal and future ideal figure, with those given more encouragement to build muscle desiring more muscular figures, but the effect lost significance as other variables were added to the model. This is likely the result of a small sample size, and would warrant further investigation in future studies.

Parent's perception of the child's current figure also predicted the child's body satisfaction, which indicated that how a parent perceives a child's body is an important factor in the development of a child's body image. Interestingly, the relationship was negative and indicated that as parents were choosing the figures with increasingly less body fat, the child's body dissatisfaction increased. No children were perceived as being muscular and as 69% of the boys were assigned the lean figure, with 6.9% of these the very underweight figure, the boys could believe that they were being appraised as being 'skinny' and underweight, which differs from the desirable, ideal, bulkier, muscular figure for males and so could lead to them feel dissatisfied with their bodies. This is supported by published research which reports that boys who believed they were underweight, had the greatest body dissatisfaction (Page et al, 1995), lower self-esteem (Pierce & Wardle, 1993), and desired increased muscularity (McCabe & Ricciardelli, 2003).

Moreover, the negative relationship would also suggest that boys, whose current figure was rated as having more body fat, would demonstrate lower body satisfaction. The largest current figure chosen by the parents in this study was the normal weight figure, and so it would be conceivable that these children could feel the least dissatisfaction with their bodies, as shown in the model, if they are aware of being perceived as a 'normal' size. However, it should be noted that no parent rated their child as the overweight or obese figures, despite the body composition measures suggesting some of the children would be in these categories. Child's

weight status is often underestimated by their parents and particularly for boys (see Jeffery et al, 2005; Maynard et al, 2003). It seemed that the children in this study were aware of their parent's appraisal of body size, as found in other published research (see Pierce & Wardle, 1993).

Furthermore, parent's perception of the child's current figure predicted the parent's choice of ideal body for the child. The relationship was positive, so as the parent chose the figures with increasingly more body fat to represent the child's current figure, the ideal figure chosen was also one with more body fat. This has also been found in research by Brann (2010), where parents of boys who rated their sons as being heavier, chose a heavier ideal body size for their child, as compared to those rated as less heavy. Perhaps this suggests the parent is picking an ideal similar to the current figure and a more realistic achievable ideal body size for their child to attain based on how their child's current figure actually is. Moreover, it indicates parents of heavier children are more accepting of a larger body size, as found in other research (see Brann, 2010). The findings also indicated that if the parent perceived their child as muscular, or lean, for their current figure size, they picked muscular or lean ideals, again suggesting they are choosing realistic ideals based on their perception of their child's current body shape.

Consistent with the findings of study 1, the levels of dissatisfaction varied significantly between the 3 body parts. Boys were expressing the greatest dissatisfaction with their arms, then torso and the lowest dissatisfaction with their legs. It seems males appraise distinct body parts differently, as found in published research (Rauste-von Wright, 1988; Ridgeway & Tylka, 2005) and emphasises the need for a scale to assess body parts separately (see chapters 2 and 5 for further discussion). To support this was the finding that, although most boys were choosing the muscular pieces for their body parts, more children chose the muscular pieces for arms, than the other body parts, which is consistent with the male stereotype of having muscular shoulders and arms (see Grogan & Richards, 2002; Tiggemann, 2011a).

Also, as found in the earlier three studies, fewer children (3 of the youngest) picked the overweight or obese figures as an ideal, as compared to other research (for example, see Riciardelli & McCabe, 2001; Truby & Paxton, 2008). None of the parents picked these figures as an ideal self or as an ideal for their child, as a child or future adult figure. This demonstrates the awareness of the stigma around being overweight as not being acceptable in Western society which develops at a young age, increases with age and continues into adulthood (see Wardle et al, 1995; Musher-Eisenman et al, 2003; Spiel et al, 2012 and chapter 2 for further discussion), but contrasts with research finding a greater acceptance of overweight figures developing in adulthood (Rand & Wright, 2000; Latner et al, 2005).

Moreover, the current measure clearly separated muscularity and adiposity meaning the desire for higher adiposity, or higher muscularity, could be determined and thus less children were choosing the figures with higher adiposity (as discussed in study 1, chapter 5). Furthermore, the scale was adapted in this study to give a lean muscular body choice, as well as the athletic muscular and hypermuscular choices available in the previous 3 studies. This was adapted following observations made during the figure selection process, where some boys were finding it difficult to choose between lean and muscular figures. Boys seemed concerned that the muscular figures had too much bulk, for example, one 8 year old boy commented, “I want one with muscly legs, but thinner so he can run properly”. This suggested that boys were evaluating their body sizes, not solely on appearance, but based on function as well (Grogan, 2008). The finding that the lean muscular body part was the most popular muscular choice for the legs body part and second for both the torso and arms body part, showed awareness of the desirable mesomorphic body shape for males, that comprises of high muscle mass, little adipose tissue, with shoulders wider than the hips), without extreme hyper-muscularity (Grogan & Richards, 2002; Barlett et al, 2008). Thus the lean and muscular physique represented a desirable body size choice for boys and should therefore be included in future body satisfaction measures.

The effect of the mass media on a child's body image was investigated using the exposure to media score which comprised of questions around exposure to hypermuscular 'superhero' type action figures, through dressing up costumes, TV, books and computer games showing these characters. Exposure to media predicted the child's ideal self and their ideal future adult figure choices. The relationships were negative, so as the media score increased, the child's choice of ideal figures became increasingly towards the more muscular figures (i.e. lower scoring figures). This was an interesting finding and suggested that children with high, regular exposure to this 'superhero' type of media, including action figures and dressing up clothes, could develop an awareness of an unrealistic body ideal for males which comprised of the hypermuscular V-shaped body type and six-pack abdominal muscles that typify the masculine identity superhero characters embody. Boy's body image could be affected by this media, because according to the Symbolic Interactionist Perspective (Mead, 1934), it is through play that children internalize and assume the appearance, personality and behaviour modelled by the toys they play with. Over multiple exposures to media messages, combined with social interaction with family and peers, the child develops an identity which integrates the ideal body with what it means to be that person and thus the child desires to be like them (see Chapter 2 for further discussion).

Moreover, this shape is unattainable for most males without the use of steroids, but is pervasive in the mass media boys are exposed to, so boys are regularly receiving messages about these male body shape ideals. For example, over time, boy's action figures have become more muscular, reaching unrealistic, unattainable proportions of muscularity (Pope et al, 1999) and children are being exposed to unrealistic shape and weight ideals as they are playing with the dolls (Brownell & Napolitano, 1995). Research shows that even male adult's body image was significantly affected by handling very muscular action figures for a short period of time (Barlett et al, 2005) and preadolescent and adolescent boys preferred to look like the physically larger action figures even though they knew they were 'less normal' than the other body shapes (Baghurst et al, 2007). The

current study indicated that exposure to this type of media could be affecting boys' body image from a young age and it could promote the desire to attain abnormal and unachievable muscle mass when they are older (Baghurst et al, 2007), possibly by unhealthy means.

The effect of family members in the household engaging in exercise on a child's body image was also investigated following comments children had made in earlier studies about family members exercising. However, there was no significant effect of the exercise score on the child's body satisfaction, the child's ideal figure choice, future adult ideal figure choice and parent's choice of ideal figure for the child and child as a future adult. Again this could be due to the limited sample size where 28% of the sample gained a low exercise score and almost a quarter of these did not have any householders engaging in exercise at all, so the impact of exercise on the child was low. Furthermore, children may not have been aware of the exercise taking part in the home. Three questions around the child's awareness of exercise, knowing the reasons why family members exercise and whether the child is spoken to about exercise were excluded from the exercise score following the factor analysis and so future research in this area could investigate the impact on the child's body image of high awareness of household exercise and involvement in exercise related conversations. As the effect of household exercise on a child's body image is not a well researched area, it warrants further investigation, but with a much larger sample.

Although there was not a significant effect of age on boy's body satisfaction, direction of dissatisfaction, ideal self and ideal future self, mean scores indicated that older boys (aged 8 to 11 years old) were choosing from a narrower range of figures for their ideal self and ideal future adult self, where 100% picked a muscular ideal body as their future adult self. This suggested that the older boys may have a greater awareness of the ideal body size and shape for men, than the younger boys and are more greatly influenced by it. Some studies show body dissatisfaction increases with age for boys (Folk et al, 1993; Rolland et al, 1997; Kostanski et al,

2004; Li et al, 2005; Eisenberg et al, 2006) and boys feel the negative effects of body image as they get older (Polce-Lynch et al, 1998), suggesting that they have a greater awareness of the ideals of body size with age. Research has also indicated that the nature of the body image concerns change with age, with younger boys choosing larger body shapes and older the leaner ones (Parkinson et al, 1998). However, as the scales used did not incorporate muscularity in Parkinson et al's (1998) study, it cannot be known whether more muscular choices would be made with age.

8.4.1. Conclusions

This study replicated many of the findings of the past 3 studies where a high proportion of the boys were dissatisfied with their bodies. Body dissatisfaction appeared to develop at a young age for some boys and the dissatisfaction was in desiring a muscular physique for each of the body parts. Again dissatisfaction was not the same across the three body parts investigated and it seemed that boys were more dissatisfied with their arms, then torso and lastly their legs, in this study. This has implications for the measures used to study body image in boys and suggests that future measures which score the satisfaction with body parts separately are to be used, in order to reveal the full pattern of body dissatisfaction in males.

Body ideals chosen by both the parent and child were following a stereotypical pattern based on societal ideals of muscularity for male bodies, as both were choosing from the muscular ideals. It seems these ideals are internalised by the children at a young age and have impacted on body choices, with those as young as four years old selecting a muscular ideal self and future adult self.

The effects of sociocultural influences on boy's body image were explored and it seemed likely that a combination of factors, parental influence and the media, influenced body dissatisfaction and ideal body choices through the messages around desirable body ideals being communicated. Findings showed that parents

might affect their child's body image negatively, as parental levels of body satisfaction and perception of their child's current body size, influenced their child's body satisfaction. These findings indicated that children were aware of how their parents appraised their current body size and how satisfied parents were with their own body. As this study shows body dissatisfaction is developing at an early age for some children, there are implications for what parents' model to their children.

Furthermore, it was found that children with greater exposure to the type of mass media that displays muscular, superhero type characters and figures are choosing more muscular figures as an ideal. Through early exposure to this media, messages around masculinity and acceptable body shapes and sizes for males are being communicated to, then internalised by, boys and thus influence the development of their body image from a young age.

Despite extensive efforts to gain participants, including recruiting participants from two schools, the sample remains disappointingly small. The number of fathers responding was also low, and as found generally there is a lack of research around sons' and fathers' body image. However, there were some interesting findings around the effects of the media and family influences on children's body image that warrant further investigation with a larger sample. This study does indicate that there are a combination of factors affecting boys' body image and some of these, such as looking at the influence of dressing up clothes, have not, to the author's knowledge, been studied before.

Chapter 9

The development of a touch screen computerised application for measuring body size perception and satisfaction in children:

One of the aims of this PhD research was to address some of the current limitations of visual scales assessing body dissatisfaction in young children (aged 4-11 years old) by developing an accurate, computerised technique to measure body image and provide more accurate and consistent findings with this age group. The project involved a cross faculty collaboration at the University of Bradford between the Division of Psychology, Faculty of Social Sciences and the Artificial Intelligence Research Group, Department of Computing, School of Engineering and Informatics. The aim was to develop a prototype of an application for a portable touch screen mobile tablet device to measure body satisfaction in children. This pre-configured assessment of body image would collect and store online the captured information. See poster (Appendix 8) for an overview of the project information.

The choice of developing the body image assessment as an application for touch screen mobile technologies was made for several reasons. Firstly**,** young children were shown to be familiar with mobile devices, such as tablets and smartphones and this technology does feature heavily in young children's lives, with toddlers and preschool aged children being reported as using them daily (Holloway, et al 2013). Also, such devices are available for children to use in many nursery and primary school settings. Figures from 2015 showed that 81% of households possessed a tablet computer, and 15% of 3 to 4 year old children, and 40% of 5 to 15 year olds owned their own (OFCOM, 2015). Mobile interactive devices hold appeal for children and a young child can assimilate the new technology quickly and navigate devices intuitively (Marsh, 2004; Piotrowski & Krcmar, 2017).

Moreover, apps have increasingly been used in research and health care settings, as well as by the general public (Tran et al, 2014). Apps are software programs

designed for smartphones and tablets and are readily available and easily downloaded from the internet. These new technologies have a wide variety of purposes, for example, they were used as a source of medical information by both medical professionals and patients (Sandholzer et al, 2014; Yaman et al, 2015). In addition, they have been used for health monitoring, such as measuring heart rate and giving electrocardiography (ECG) Arrhythmia readings (Xue et al, 2015), or utilized as tool for changing health related behaviours, such as for smoking cessation (Whittaker et al, 2012). They have also aided treatment of certain conditions and those designed for mental health interventions, for instance, have been shown to be effective in treating disorders such as anxiety and depression (Harrison et al, 2011).

Regarding body image specifically, there are many apps available for weight control and management. In one study, obese adolescent girls who used an intervention delivered through an app, saw an improvement in body composition and self esteem (Min-Kyung & Ju-Young, 2016). There are also free apps available for personal image editing of photographs of the face and morphing of the body and although these were designed for entertainment, they do demonstrate the capabilities of the software to be used to create an app where body figures could be manipulated and changed for research purposes (for example see, Modiface, 2016; Hamsoft, 2017). One app designed with such technology was avatar based and used for improving body perceptions in adolescent girls (Lyles et al, 2017). Here the researchers took a body scan of the adolescents and created 3D representations of their bodies where the size could be manipulated by the participant at different body sites. This gave a visual representation of the adolescent's bodies at different stages following the positive changes they had made in health behaviours (Lyles et al, 2017).

Furthermore, apps have enhanced research practices and made data collection more efficient, for instance, there are apps that have enabled the researcher to record audio and take notes in qualitative research, and others that tracked health

behaviours (Moylan et al, 2015). In terms of body image research with children, the advantage of using an app on a mobile tablet that could be taken into the school environment is its portability, ease of data collection and the safe and quick storage of data. Moylan et al (2015) suggested that mobility in research is important and the use of tools such as mobile smartphones and tablets support this. The development of a body image app would make body image accessible for children, improve on traditional pencil and paper measures, and be specifically designed and built for preadolescent children, rather than adapted from measures for older participants, as most current measures are. The interactive nature would permit children to be active in the task, thus helping to maintain children's attention.

9.1. Key considerations

(Some key considerations are discussed in more detail in chapter 2).

9.1.1. Choice of device

The Android mobile platform was chosen over others as it was the most popular operating system for mobile devices and when the prototype was being developed, the Android platform had a market share of around 80% (Etherington, 2013). Android was based on the Linux kernel and programmed using C and C++ with the interface design and applications programmed in Java. Java was a good choice because of the security of the data it gave (as discussed later in section 5.1.8.). An advantage of Android was that it was used on a variety of devices and could access Google's open source community, which permitted free development and easy distribution of software. The Google Nexus 7 tablet, which used Android version 4.4, had a 7" screen, large enough to clearly display the relevant information for the researcher, whilst being lightweight and so easily held and handled by a child.

9.1.2. The age of the participants

As the body image measure was to be used with younger children from 4 years old, it had to take into account their limited attention span, their inability to deal with complex cognitive demands, and be easy to use without the need for complex

instructions or demonstrations (Hill, 2012). For these reasons, a visual measure was used which presented a novel task in order to maintain the child's attention and keep them engaged during the task. The design of the app was child friendly and multisensory, with big bright buttons and colourful images and shapes, designed to be appealing to younger children and considered to encourage the children to interact with it. The program was designed to be intuitive, with screens easy to navigate by both the child and researcher (figure 9.1). The basic user activities that would be accessed by the child were simple with colourful graphics and few buttons.

9.1.3. Realism of the figures

The assessment itself incorporated photographic images of a child's body positioned in a frontal view with the arms located away from the body, thus it addressed issues of realism of the figures (as discussed in Thompson & Gray, 1995). The figure was dressed in modern underwear (underpants for boys, pants and small vest for girls) and so the torso, arms and legs were visible, which enabled muscular definition to be viewed. Moreover the figures were based on a measurable index of adiposity, such as BMI (see also Truby & Paxton's, 2002, Children's Body Image Scale) (see figure 9.2).

During an initial participant 'interview' before the task is started, non identifiable data will be collected about each child, such as gender, ethnicity and age in months, and added to the database. Children's body measurements (height, weight and BMI for example) are measured via the assessment process and recorded into the database (see figure 9.3, page 190) to be accessed and reviewed at a later date. The perceived current figure selected and the child's BMI can be correlated to determine the accuracy of the child's perceived body size.

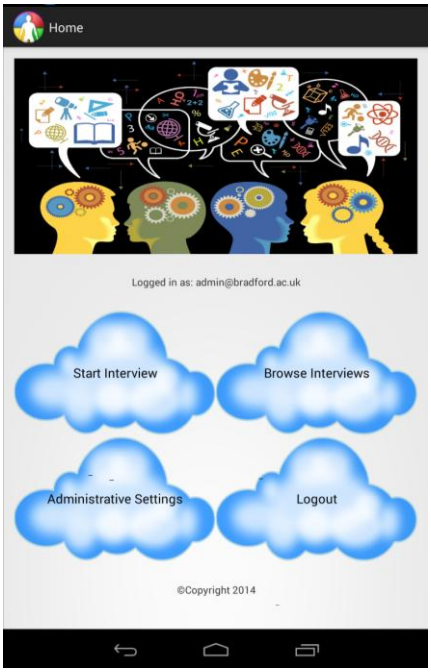


Figure 9.1 - Main Menu Activity screen giving clear options for the researcher

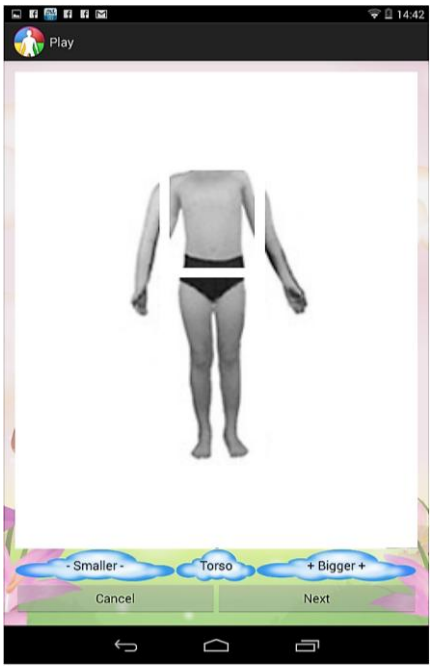


Figure 9.2 - Example of a boy's body used in the prototype which was linked to a measurable index of adiposity and manipulated at 3 body sites

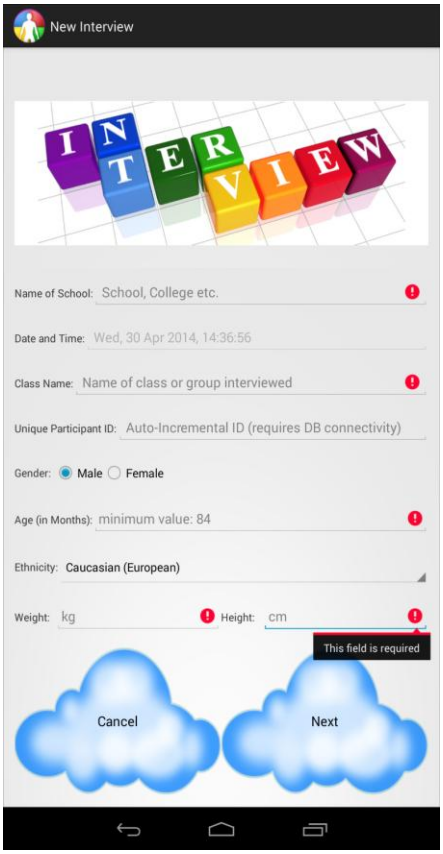


Figure 9.3 - The interview screen where initial data is collected from the child and added to the database

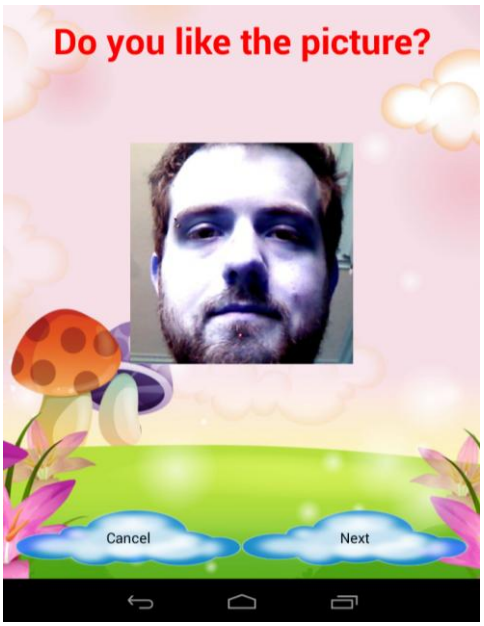


Figure 9.4 – The photograph of the head which will be added to the body for the task

Due to the problems of BMI, as discussed earlier, future modifications of the app aim to incorporate data about the children's bodies taken from other measures, prior to the task. This could include waist circumference and bioelectrical impedance. Bioelectrical impedance is used to measure the child's body composition and gives a measure of body fat and muscle mass (see chapter 4, section 4.3.1.3 for an explanation of how this works). The researcher enters the data into the app and these measurements would enable the scale to be linked to a measurable index of muscularity and adiposity.

A boy and girl figure representing two age groups (one for a child aged approximately 5-6 years old, but appropriate for a 3-7 year old choice and an older, preadolescent child around 9-10 years old, but appropriate for an 8-11 year old choice) will be developed. During a photograph session activity, before the task started, the child's own face is photographed (see figure 9.4) and positioned on the body for the task (figure 9.5), thus accounting for cultural and racial differences (Gardner, 2002; Hill, 2011) and enabling children to identify with the whole image as the self (Hayes & Tantleff- Dunn, 2010) as discussed in chapter 2.

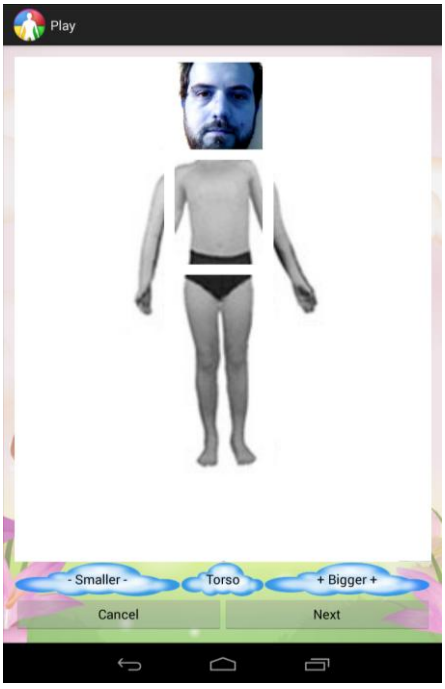


Figure 9.5 - The photograph of the child's head added to the figure

Facial detection was an important feature of the app and it used OpenCV (Intel, no date), an image processing library available online developed by Intel, which contained more than 2500 optimized algorithms. It was suited for the project because it supported multiple programming languages (like C++, Python, MATLAB and Java) and platforms (Windows, Linux, Android and MacOS) and was both freeware and open source.

The assessment itself involved images of lifelike figures presented on a touch screen which can be manipulated into different body shapes (e.g. thinner, fatter, more muscular, less muscular), at 3 different body sites (the torso, arms and legs), with tapping, pinching and spreading finger movements. The child will complete a simple initial game task to enable the researcher to check they have the necessary manipulation skills to complete the assessment successfully. For example, the child is asked to tap the screen to pop bubbles, use the pincer and spreading movements to make a blowfish become larger and smaller. The child may also tap the 'smaller' and 'bigger' buttons at the bottom of the screen to manipulate the figure if they struggle with the manipulation using finger movements alone (see figure 9.4). The child is given instructions about the task initially, but should need little adult direction to complete it once they understand what is required of them. Moreover, younger children may have difficulties in verbalising their beliefs. Therefore, the measure is preverbal where children touch the screen and manipulate the image in response to instruction, without the need to give a verbal response.

9.1.4. Scale issues

'Coarseness of the scale' (Gardner et al, 1998a) was addressed by asking the child to manipulate the figure and alter it to the desired size. This represented a continuous scale rather than asking the child to pick from discrete images, as with the typical figure scales. In this way the graduations in the shapes between the figures were consistent and standardised and thus the scores represented interval data.

9.1.5. Assessment of three body parts

To enable assessment of satisfaction with individual body parts, the child was able to manipulate and alter their chosen figure at 3 separate body sites (arms, legs, torso) to the desired size (thinner, fatter, more muscular, less muscular) with the buttons or finger movements. This gives a more accurate picture of body satisfaction because the child can demonstrate satisfaction with one body part and dissatisfaction with another and they do not have to make a compromise as they do when making a judgement on a whole body figure. This was an important feature, as findings from this thesis (discussed in chapters 5, 8 and 10) and published research, suggested variations in children's satisfaction between body parts (Davies & Furnham, 1986; Gila et al, 2005; Rauste-von Wright, 1988) (see chapter 2 for further discussion).

9.1.6. Assessment of both adiposity and muscularity

The scale was developed to incorporate muscularity alongside adiposity, as again findings from this thesis (discussed in chapters 5, 6, 7, 8 and 10) and published research, suggested that muscles were a concern of many boys and some girls (Ricciardelli et al, 2003; McCabe et al, 2005; 2006; 2007). As discussed in chapter 2, scales that did not include muscularity were not exploring a central concern of males (Cafri & Thompson, 2004). The scale developed for this thesis clearly separated the desire for bulk due to adiposity, and bulk due to muscle**,** giving a more comprehensive picture of body image in preadolescent children.

9.1.7. Data collection

The measurements of the manipulations of the body part at various stages of the child selecting the size were recorded into the database and onto a server. The size of the body part corresponded to a scale and the measurement/number was recorded onto a server. All manipulations and measurements could be recorded if necessary, or just the final size/shape selected during each condition of the task. The direction of dissatisfaction was also calculated. This would be linked to a database of anonymised information collected about the child such as gender,

height, weight and age in months (figure 9.6) and the child is given a unique participation number. Results from each trial would be recorded with the child's data and stored on the database. Please note the child's photograph is to be removed after the test session and is not stored on the database. Data from each trial can be uploaded into a statistical analysis package such as SPSS.

9.1.8. Data: Storage, security and confidentiality

All data is saved onto an online database when the device is connected to the internet. The system sends and receives data as the test progresses in small increments, which ensures data integrity. Information is encrypted and the app itself password protected with the research team having the sole access to it (see figure 9.7). It is essential that the data is secure and can only be viewed by authorized users. Two types of accounts were set up on the device. A standard user account which gives access to basic functionality like conducting an interview session or viewing past interview results from the sessions the user had conducted. The administrator account has all the functionality of the standard account, plus the ability to view interview sessions from all the users in the system and the permission to add, modify or delete users and administer their privileges. Considerations of security were deliberated during all phases of development. The choice of language was Java which handles security at code level and the system chosen was MySQL because there are several security options available for data protection. Resources were made available for security options like improved antivirus on-access scanning and auditing/logging.

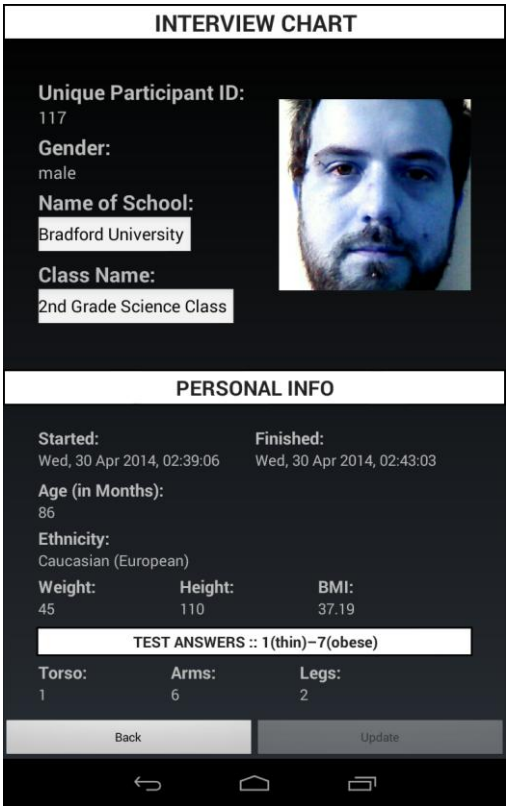


Figure 9.6 - Results from each trial is recorded with child's data

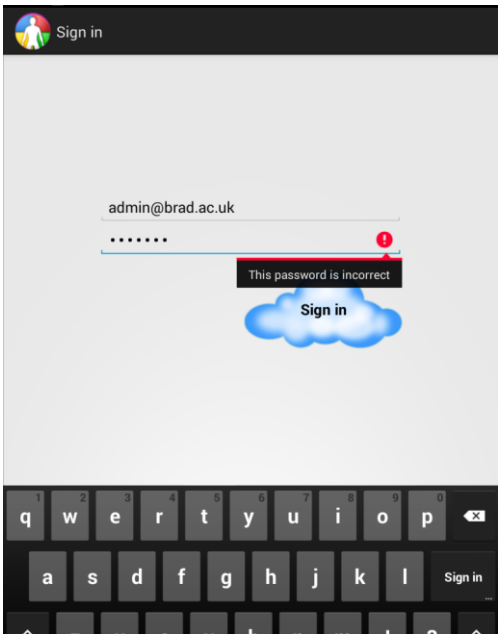


Figure 9.7 - Secure Login Screen with validation example

9.2. Summary

Only when the methodological problems of visual body image measures are addressed, will a complete picture of body size perception and dissatisfaction in young children emerge. Researchers and students from the Divisions of Psychology and Computing collaborated to develop a touch screen-enabled mobile application which runs on Android devices to measure body size perception and satisfaction in preadolescent children. The outcome of this project was a working prototype of the assessment with some of the issues addressed, which enabled some detailed data to be collected regarding body image perception. The prototype will be developed further in the near future, and the finished model will be tested for reliability, validity and functionality and implemented for mobile devices. The app was presented at the Digital Health Seminar for the VC's Interdisciplinary Research Seminar series at the University of Bradford and also the project was awarded 'The Best Computing Final Year Project Award of 2014', with the inputs and possible impacts being highly commended by the Board of Examiners (see Bradford University article, Appendix 9).

9.3. Future Developments

9.3.1. Improvements to the quality of the images

- To seamlessly splice the body parts and head to give the appearance of a whole figure, but which still allows manipulation at the 3 body sites.

- Make available a selection of skin tones making the image more applicable to different ethnic groups. A further improvement is for the software to match the colour from the photograph of the child's face to the body, to give a more realistic skin tone and aid the child in viewing the image as a representation of self.

9.3.2. Increasing the number of tasks performed

- To develop a bank of male and female images where children can select a future adult self figure, an ideal girl, boy, man or woman, or averted figures (as in study 2, chapter 6).

- Adapt the measure for use with adolescent populations and adults. Manipulation of more body sites could be developed for this, including the ability to alter the thighs independently from the calves, the upper torso from the lower torso, and being able to change the shoulders, or breast size for women.

- To enable participants to alter the appearance of a figure from the back view, so buttocks could be changed, for instance.

- Consideration also needs to be made of the capacity to update body shapes due to cultural shifts in body ideals over time. For example, there has been a shift towards a more 'voluptuous' shape (slim waist, with large breasts and buttocks) for young women, alike to the celebrities seen in the media at this point in time. It is probable that adolescents and children would be influenced by this media and could desire the body shapes modelled by these celebrities.

- To link the images to measures of waist circumference and body composition. This would allow for a comparison to be made between the child's perception of their current body size and their actual body measurements, in order for researchers to determine accuracy of a child's body size perception.

Chapter 10
General discussion

The aims of this thesis were to improve visual measures used to assess body satisfaction in children aged 4 to 11 years old, through the construction of a scale which incorporated muscularity, alongside adiposity, and assessed body parts separately at 3 different body sites (arms, legs and torso). Part of the thesis focused on the development of a prototype of an application for a portable touch screen mobile tablet device to measure body satisfaction and body size perception, which aimed to address several existing issues with figure scales and store gathered information online.

Further aims were to fill some of the gaps in the literature around weight, muscularity and body satisfaction by exploring different factors thought to influence the development of body image in preadolescent children. This was achieved through 4 experimental studies, each employing the visual scales constructed for the thesis, in addition to using a questionnaire for parents in the final study. The main findings are summarised below:

- Boys demonstrated higher body dissatisfaction than girls (chapters 5, 6 and 7).
- The desire for a muscular figure was found in children much younger (4 years old) than reported in other quantitative studies and some girls desired muscularity also (chapters 5, 6 and 7).
- Far fewer children chose the overweight figures as an ideal self than seen in other research studies (chapters 5, 6, 7 and 8).
- Girls were equally dissatisfied with each of their body parts, whereas boys' dissatisfaction varied across the body parts (chapters 5 and 8).

- Stereotypical idealised body perception was seen in young children where boys wanted to be muscular and girls wanted to be lean (chapters 5, 6, 7 and 8).

- Ideal body choices saw boys choosing more muscular figures and girls more lean figures for the self than the ones they chose for another boy or girl, and boys chose more muscular ideal figures than what they perceived the opposite sex would choose (chapter 6).

- Overweight builds were perceived the most negatively and children did not want to look like the overweight figure as a child or adult (chapter 6).

- Negative attitudes towards overweight builds were present in the youngest children (from 4 years old) to the oldest (11 years old) and the overweight figure was assigned the most negative attributes (chapter 7).

- The pattern of assigning positive attributes to figures of a different size was gendered, where boys viewed the hypermuscular figure, and girls the normal weight and lean figures, the most positively (chapter 7).

- Body dissatisfaction developed at a young age for some boys and girls (chapters 5, 6, 7 and 8).

- Gender (chapters 5, 6 and 7), age (chapter 6) and ethnicity (chapter 6) were factors that had an effect on children's body dissatisfaction and choice of ideal figure.

- Perceived, and not actual body size, influenced body satisfaction and choice of ideal figure, and it was the children who perceived themselves as overweight or obese who were the most dissatisfied with their bodies or body parts (chapters 5, 6, 7 and 8).

- There were sociocultural influences (parental influences and media influences) on boys' body satisfaction and ideal body choices, and thus were important factors in the development of boys' body image (chapter 8).

The aims were met in this thesis and many of the results were replicated over the 4 studies. The findings will be explored in more detail in this discussion.

10.1. Evaluation of the body satisfaction measures used

Throughout all of the studies, the scales developed and employed were designed to address some of the limitations of visual body size satisfaction measures traditionally used with preadolescent children. This was an integral part of the thesis because without adequate measures, some published research findings are inconsistent and researchers are not gaining a comprehensive picture of body image early in life.

The finding in all studies that boys demonstrated higher body dissatisfaction with their bodies than girls, was an important result and contrasted with published research, where girls were found to be more dissatisfied than boys (see Robinson et al, 2001; Williamson & Delin, 2001; Rinderknecht & Smith, 2002; McCabe & Ricciardelli, 2004). The author proposes this was likely due to use of the measures that incorporated both muscularity and adiposity into the scale. This allowed children to make a muscular choice if they wished to do so, thus children demonstrated dissatisfaction with their bodies that they could not usually express in studies that employed a measure that assessed adiposity alone. This finding also indicated that boys may feel the similar pressures to conform to a particular body type, as girls do, which could later impact on their wellbeing, such as lowering their self esteem, or leading to depression (Mcreary & Sasse, 2000).

Furthermore, the desire for a muscular figure was found in children much younger (at 4 years old) than reported in other quantitative studies. The questionnaire method typically used in other published research (see Ricciardelli et al, 2003; McCabe et al, 2005; 2006), revealed a desire for muscularity emerging at around 8 to 10 years old (McCabe et al, 2005; 2006). However, this method is known to be unreliable with children under the age of 8 years old due to limitations in younger children's cognitive abilities. For this reason, there is limited quantitative research

exploring muscularity with younger age groups. An advantage of the visual measures developed in this thesis was they were able to be used by younger children and the tactile nature of the jigsaw measures encouraged engagement and participation in the task (chapters 5 and 8). The desire for muscularity was also expressed by a high proportion of girls, as found in other research (Ricciardelli et al, 2003; McCabe et al, 2006) and so emphasises the importance of including girls in research exploring muscularity (McCreary, 2011) and the need to use an appropriate measure to explore the desire for muscularity in younger children.

Published research had shown that around 0%-36% of girls and 13%-48% of boys chose a larger body shape as an ideal, and usually from the obese or overweight figures (Thompson & Chad, 2000; Ricciardelli & McCabe, 2001; Ricciardelli et al, 2003; Clark & Tiggemann, 2006; Ricciardelli et al, 2006; Duchin et al, 2015). These figures may be chosen as ideals because, in the absence of muscular figures in the scale, they appear to represent 'bulk' due to muscularity (see Brann, 2010; Cohane & Pope, 2001). Throughout the 4 studies within this thesis, fewer children (0%-3.4% of girls and 0%-10.6% of boys) chose the overweight or obese figures or body parts as an ideal self or a future adult self. Consequently, it is the author's suggestion that the children were not as confused over the two separate dimensions (muscularity and adiposity) as others have been when using traditional figure scale measures, because both dimensions were included in this new measure. Interestingly, it was a small number of the youngest children (4 to 5 year old girls and 4 to 7 year old boys) who selected the overweight or obese figures as an ideal and could indicate that some were still confused over what the figures represented in terms of adiposity and muscularity, but to a lesser extent than in published research.

Moreover, the use of the body satisfaction jigsaw enabled satisfaction over three individual body parts (torso, arms and legs) to be expressed. Thus, this gave a more accurate picture of the pattern of satisfaction over the body, since children did not have to compromise over which figure best represented their feelings about

their body parts, as they do when making a judgement on a whole body figure (discussed in chapter 2). In chapter 5, this revealed that girls were equally dissatisfied with each of their body parts, whereas in chapters 5 and 8, boys' dissatisfaction varied significantly between the body parts. This is supported by published research where children and adolescents have been shown to demonstrate different levels of satisfaction with various parts of their bodies (Rauste-von Wright, 1988; Gila et al, 2005; Ridgeway & Tylka, 2005). This finding emphasized the importance of using a measure that assessed individual body parts, particularly with boys, as one that assesses the whole body may not accurately reveal the true pattern of body dissatisfaction for boys (Rosenblum & Lewis, 1999).

An important part of the thesis was to integrate the knowledge gained from the findings of the 4 studies about the effectiveness of the improvements made to the scales, into the development of the prototype of an application for a portable touch screen mobile tablet device to measure body size perception and satisfaction in preadolescent children. As discussed, the findings of the thesis demonstrated the need to include both adiposity and muscularity into the scale and to assess body parts separately. Several existing issues with the figure scales, such as coarseness of the scale and the addition of a photograph of the child's face, enabling children to identify with the whole image as the self (Hayes & Tantleff-Dunn, 2010), were also addressed (see full discussion in chapter 2). The collaboration with researchers and students from the Divisions of Psychology and Computing was deemed successful and resulted in a working prototype which allowed some detailed data to be collected regarding body image perception. It is proposed that the prototype will be developed in the near future (as detailed in chapter 9) and tested in a series of studies for its reliability, validity and functionality.

Overall it was felt that the measures developed for this thesis would be appropriate for use with the 4 year old to 9 year old age group predominantly. However, a

further consideration to make about the measures is that the body shapes and sizes do not currently represent the body shape of a child going through puberty, which could be at the age of around 9-11 years old for some children, and so modifications to the measure could be required for future studies in order to assess body satisfaction in this age group of children accurately.

10.1.1. Appropriateness of the measures used for the age group being studied

Throughout each study, careful consideration was made of whether the children adequately comprehended the concepts involved in the task and if they felt able to respond in the way they wanted to. Through familiarisation with the task, modelling and careful questioning, combined with an observation of the children during the activity, it is the author's belief that the children had a good understanding of what they were being asked to do and some comprehension of the concepts involved. Some younger children did become distracted by details on the figures at times (as Hill, 2012), but were redirected to the task easily. It has been shown that children from the age of 4 years old are able to reflect on aspects of self and identity (Eder & Magelsdorf 1997; Marsh et al, 2002) and spontaneous comments made by the children were recorded in this thesis to support the belief that they could reflect on aspects of their own and others bodies in the tasks (see chapter 4 for further discussion).

However, one limitation of the ideal figure choice tasks was the difficulty in determining whether the child's figure choice was made because it represented the body shape the child wanted to have, or simply reflected their response to a perceived pressure to choose the 'correct' figure and the one they believed to be the socially accepted body shape (as discussed by Brown & Slaughter, 2011). Some of the comments the children made during the activity suggested they did chose a figure based on what they would like to look like, but it is not possible to know this for certain and thus highlights the complexity of studying body image with preadolescent children. Still, what was demonstrated was support for the

awareness that even the youngest children had, of the stereotypical idealised body shape for their sex. Although it is possible the child may not have internalised these ideals as a preference for the self (Thompson & Stice, 2001; Harriger et al, 2010), these ideals can exert an influence on body dissatisfaction (Grogan, 2008; Bergstrom & Neighbors, 2006) which could develop for the child at a later age.

10.2. Preadolescent children and stereotypical idealised body preferences

Significant gender differences were found in the ideal body figure or body part choices for the self and future adult self, as found in chapters 5, 6 and 7, and supported in some published research (for example, see Truby & Paxton, 2002; Ricciardelli et al, 2006; McCabe et al, 2007 and chapter 2 for a discussion). The direction of body dissatisfaction for girls was in desiring a leaner body and for boys, a more muscular body and this was found in children at all ages throughout all of the studies. These choices reflected an awareness and/or internalization of a stereotypical idealised Western body perception around the body sizes deemed desirable for males and females, which saw children conforming to the distinct body shape endorsed for their sex (Barlett et al, 2008). For boys, the body shape reflected the internalisation of a muscular ideal comprising of a muscular physique with defined ‘six-pack’ abdominal muscles (Grogan & Richards, 2002; Labre, 2005; Thompson & Cafri, 2007; Tiggeman, 2011) and for girls, the thin ideal, as defined by a lean physique, (Davison et al, 2000; Schur et al, 2000; Truby & Paxton, 2002; McCabe et al, 2007).

Chapter 6 widened the scope of the investigation into body ideals to include the children’s perception of what an ideal male or female, other than the self, should look like. Ideal body shapes picked by both sexes for the boy and man again followed the stereotypical idealised muscular body type for males, with boys placing more importance on the muscular body shape than the girls. The ideals picked for a girl and woman by both sexes were of normal weight, with the girls’ second highest choice being the lean figure. This was a surprising result, as the normal weight figure had a higher adiposity to the stereotypical lean female ideal, but the choice of the normal weight figure over the lean found in this study, could

have been due to the sample of children that reflected a more diverse ethnic mix, with only a fifth of these categorised as White British. It may also have indicated the children's awareness of what a 'normal' shape for a female figure was. This is supported by some published research where older children (aged 14 years old and above) chose the normal weight female figure as the most attractive, over the lean and overweight figures (Connolly et al, 2004).

Interestingly in chapter 6, the ideals the children chose as an ideal other child (not self) for their sex, differed from the ideal they selected for the self. The self ideals chosen were significantly leaner for girls, and more muscular for boys, than the ideals picked for another child and thus conformed more to the stereotypical idealised shapes endorsed for their sex. In addition, girls accurately perceived the boys' preference for a leaner figure for a girl, which further demonstrated the awareness both boys and girls had of the importance of thinness for the female figure (see Connolly et al, 2004; Winkler & Rhodes, 2005; Benninghoven et al, 2007; Smith et al, 2007 and chapter 6 for a discussion). Boys on the other hand, chose a more muscular figure than the one they perceived a girl would choose for a boy, which showed that the boys placed more importance on muscularity for males than girls did, as supported by published research in this area (see Ricciardelli et al, 2006; McCabe et al, 2007). These findings suggested that children are developing a distorted view of what their ideal body should look like, based on stereotypical ideals of what is socially valued for their gender, and these beliefs are developing from a young age, as they were evident in the youngest children aged just 4 years old.

Ideals of body size and body satisfaction are known to be influenced by culture (Smolak, 2011; Tiggemann, 2012), and there was some evidence that ethnicity did influence the girls' choice of ideal figure for the self in chapter 6. Results showed that girls from different ethnic groups chose different body ideals, for example, most Pakistani girls chose a lean ideal figure, White British girls, the athletic muscular figure and White Eastern European girls, the normal weight figure. This

effect was not found for boys, where boys from all ethnic groups chose the muscular figures as an ideal self. This could indicate that the muscular male stereotype is more pervasive across different cultures than the thin female ideal.

It should be noted that there was difficulty when investigating the effect of ethnicity for this thesis, namely because the cohorts in studies 1 and 4 were predominantly white and middle class and so sample sizes for different ethnic groups were small and not equal. Similar differences in ideal figure choices were observed between the ethnic groups in chapter 7, as chapter 6, as the cohorts were alike in ethnic diversity, but these results did not reach significance. Studying the effects of ethnicity on children's body image is known to be complex, due to many mediating variables, such as the media (Pallan et al, 2011) or length of time the family has lived in the country, which could account for the differences in ideal figure choice found in this thesis. There is a need for future research to be conducted using larger samples of ethnic minority groups of preadolescent boys and girls living in Western areas, to investigate the mediating factors more fully in order to illuminate findings in this understudied area.

10.3. Attitudes towards figures varying in muscularity and adiposity

The thesis moved on in chapter 7 to consider why children made the ideal body choices they did, through asking them to assign positive and negative attributes to figures that varied in muscularity and adiposity. Findings indicated that the pattern of assigning positive attributes was gendered and in keeping with the stereotypical ideal figure choices children made for their sex. Boys demonstrated a positive attitude towards the hypermuscular figure through the assignment of most of the positive attributes, such as being brave and hardworking, to this figure. In contrast, girls viewed the normal weight and lean figures the most positively and assigned them positive attributes such as hardworking and kind. It is known that attitudes held about figures influence children's beliefs around the body sizes that are acceptable in Western societies (Tiggemann & Pennington, 1990) and shape their choice of personal ideal, because conforming to the ideal symbolizes success (Hill

& Silver, 1995). It is proposed that the children were aware of or had created a stereotype of what different sized figures were like in terms of their physical, personal and social characteristics and they chose these figures as ideals because they wanted to be like them and assume the characteristics they perceived they had. An investigation into the attitudes children held towards figures varying in muscularity and adiposity clarified why over half of the boys in this study chose the hypermuscular figure, and between a third and a quarter of the girls the normal weight or lean figures, as their ideal body.

Furthermore, in investigating the assignment of negative attributes, it was clear that both boys and girls viewed the overweight figure the most negatively, assigning it as the one who told lies, for example, and it was chosen as the one children did not want to play with. These findings mirrored the body size stereotyping of being overweight in Western society (Puhl & Brownell, 2006; Puhl & Latner, 2007). It has been suggested such stereotypes form the foundation from which children absorb beliefs about different sized bodies and internalise the thin ideal, and can lead the development of body dissatisfaction (Blowers et al, 2003; Spiel et al, 2012). These biased attitudes were pervasive across the 4 different cohorts of children and were demonstrated at all ages from 4 years old to 11 years old. Consistent with this, findings throughout all of the studies in this thesis, showed that the overweight and obese sizes were chosen the least often as an ideal for the self, future adult self, or as a body ideal for a boy, girl, man or woman. The overweight figure was also chosen as the one children did not want to look like as a child or adult. There were no gender differences in these opinions and all the findings indicated that children were aware, from a young age, of the negative weight attitudes and stereotypes being transmitted around having a higher adiposity (see for example, Musher-Eisenman et al, 2003; Spiel et al, 2012; Worobey & Worobey, 2014) such as the idea that being overweight equates to lack of success and impaired social functioning (Hill & Silver, 1995) and so, they did not want to be like these figures or assume the characteristics they perceived they had.

As discussed earlier, it was noted that only a small number of the youngest girls (aged 4 to 5 years old) and boys (aged 4 to 7 years old) chose the overweight or obese figures as an ideal and this could indicate that a greater understanding develops with age that being overweight is not a desirable or an acceptable body size in Western society (Cramer & Steinwert, 1998; Musher-Eisenman et al, 2003; Spiel et al, 2012). This awareness seemed to develop at a younger age for the girls than the boys in the studies within this thesis, perhaps because girls become conscious that society views adiposity as less desirable for females and that female bodies are objectified and judged more on appearance, than male bodies are (see Mazur, 1986; Stiles et al, 1990; Levine & Smolak, 2002).

In addition, the hypermuscular figure was also viewed negatively by girls, being assigned many negative attributes by them and not often chosen as an ideal. In all of the studies conducted with girls (chapters 5, 6 and 7), girls who perceived their current body size as muscular, desired to be less muscular, which suggested they were aware of the importance of an acceptable level of muscularity, as well as adiposity for females, in keeping with societal ideals of body shape for women that prescribe females to be thin and physically fit (Forbes, et al, 2004; Tiggemann, 2011a), but with an acceptable 'feminine' amount of muscular toning (see discussion in chapter 2).

10.4. Sociocultural influences: Where the messages are coming from

It was evident from the findings in earlier studies that the children held some fixed attitudes towards different sized bodies and how they should look in terms of their adiposity and muscularity, so the aim of chapter 8 was to investigate where these messages were coming from, to elucidate why boys had developed a preference for the muscular figures.

A media score was calculated from the questionnaire to parents that asked about their son's exposure to different types of media that were proposed to transmit messages around muscular bodies, such as superhero television programmes,

dressing up clothes and action figures that promote a muscular physique. Findings revealed that exposure to this type of media predicted the child's ideal and future ideal adult figure choices, where high, regular exposure, resulted in the preference for the muscular figures. The media transmits messages around a masculine identity and the characteristics associated with being a male, such as being powerful, strong, brave, and possessing a hypermuscular, V-shaped body type with well defined six-pack abdominal muscles, and this study suggested that boys were absorbing these messages. Thus, through this media aimed at them, boys from a young age were made aware of the desire for males to have muscular bodies and the findings indicated that this influenced their choice of figure for the self as a child and future adult. These findings, combined with those of chapter 7, suggested the boys viewed these figures positively in terms of their perceived personality and social attributes, as well as their physical attributes and in choosing the muscular figures, they desired to be like them and assume the masculine identity being conveyed.

Chapter 8 also revealed that implicit messages about body image from parents influenced the boy's body image as well. Firstly, parental body satisfaction was a significant predictor of the child's body satisfaction and so, the more dissatisfied the parents were with their own bodies, the more dissatisfied the boys were with their bodies, as supported by published research (see Hall & Brown, 1982; Brown & Ogden, 2004). These findings suggested that if a parent held negative feelings about their own bodies, they might model negative body image through their attitudes and behaviours towards their own bodies. Boys were aware of their parent's negative body image and so it impacted on their own body satisfaction.

Furthermore, findings indicated that boys were aware of the way their current body size was being perceived by their parents and this was having an impact on their levels of body satisfaction as well. Parental perception of the child's current body size as underweight or normal weight (muscular or overweight figures were not chosen), predicted the child's body satisfaction. Those perceived as underweight

had the highest body dissatisfaction and those perceived as normal weight had the lowest levels and were satisfied with their bodies. Perhaps the boys perceived as underweight felt the greatest body dissatisfaction because they were aware that their bodies did not match the muscular ideals and so they desired to increase their muscularity, as found by McCabe and Ricciardelli (2003) in their research.

Findings also indicated that parents could be transmitting implicit messages around muscular bodies, as the media were. Parent's choice of ideal figure for their own body, predicted their choice of future adult figure for the child, and so mothers and fathers who made muscular choices for the self as an ideal, also made more muscular choices for the child's future adult ideal. Boys could be aware of their parent's preferences for a muscular body and so again messages around the desirability of a muscular physique was being transmitted to the boys.

Overall, chapter 8 showed that a combination of sociocultural influences impacted on the boys' body satisfaction and ideal body choices and thus were important factors in the development of the boys' body image. It seemed that boys were aware of the implicit messages being transmitted about acceptable bodies via their parents. The boys' perceived negative appraisals of their current body size and parent's body satisfaction, led to increased body dissatisfaction in the child. Furthermore, boys consuming more of the 'superhero' type media aimed at them, were making more muscular ideal body choices. Generally, the impact of certain types of media on body image, such as action figures, has not often been researched with boys, and the influence of dressing up clothes less so, if at all. The findings from this study add to the literature around body image development in preadolescent boys and indicate the need for sociocultural factors to be explored in more depth.

10.5. Further mediating factors in the development of young children's body image

Gender, age and BMI have been identified as the main factors influencing the development of body image in children (Flannery-Schroeder & Chrisler, 1996; Gardner et al, 1997; Ricciardelli & McCabe, 2001; Thelen et al, 1992, see chapter 2 for discussion), but as results are inconsistent, one of the aims of this thesis was to investigate these factors further.

There were significant gender differences in ideal figure choices and the level of body satisfaction between boys and girls. Boys were more dissatisfied with their bodies than girls and boys demonstrated different levels of dissatisfaction across the three body parts, in contrast to girls who, were equally dissatisfied over their body parts. Moreover, boys and girls were demonstrating stereotypical idealised body perception for their sex in the ideal body choices they were making (as discussed earlier in this chapter and in chapters 5, 6 and 7).

The findings of this thesis could not clarify the effect of age on body (dis)satisfaction. Body dissatisfaction did not develop at a particular age for the children, rather girls and boys across all age groups from 4 to 11 years old, demonstrated dissatisfaction with their bodies or body parts. However, it should be noted that body dissatisfaction developed at a young age (4 years old) for some children and this was found across all of the studies. Moreover, there was not a consistent, significant difference between the age groups in their levels of body satisfaction throughout the studies when the discrepancy (satisfaction) score was reported. However, when looking at the mean direction score (in chapters 6, 7 and 8), there were some significant differences between some of the age groups, and the mean direction score generally revealed a steady increase in body dissatisfaction with increased age for boys and girls. This is supported with published research (see Kostanski et al, 2004; Clay et al, 2005; Li et al, 2005; Eisenberg et al, 2006) where throughout preadolescence there has been found to

be a steady increase in children's negative body perceptions (as Veldhuis et al, 2012).

One of the aims of this thesis was to report the direction of body dissatisfaction (as suggested by Dion et al, 2016). The direction score was calculated to overcome the issues found in some published research, where boys' choices that were divided between the desire for leanness or greater adiposity, meant the scores cancelled each other out, thus making it appear boys were not dissatisfied with their bodies (see McCabe & Ricciardelli, 2004 and chapter 2 for discussion). It was noted in chapter 6 that the discrepancy score and the direction score each revealed a different pattern of dissatisfaction across the age groups for girls. This emphasizes the complexity of studying body image and highlights the need for a consistent approach to reporting the results of research.

An interesting finding about age as a factor from two of the studies (chapters 5 and 8), is that the younger children (aged 4-7 years old) picked a wider range of figures as an ideal and sometimes the more unrealistic figures, such as the hypermuscular 'superhero' figure, the unhealthily lean one, or at times the overweight or obese figures. Perhaps this suggested that younger children did not have a fixed idea about how they should look or could not assess what body type was realistic and achievable for them. Future research could explore whether younger children understand what a realistic body shape is. Moreover, it could also be that younger children responded in a socially desirable way, they picked a range of ideals because they were more susceptible to trying to find the 'correct' figure and the one they perceived the researcher wanted them to pick.

In contrast, older children (aged 8-11 years old) in chapters 5, 7 and 8, were choosing from a narrower range of figures for their ideal self. This effect was found more often with boys, where in chapter 8, 100% of the older boys picked a muscular ideal body as their future adult self and their ideal preferences shifted from the hypermuscular figure to a more 'realistic' athletic muscular one. This

suggested there could be a change in the development of body ideals with age. Parkinson et al (1998) also found boys' body image concerns changed with age, with younger boys choosing larger body shapes and older boys the leaner ones from a scale with figures varying in adiposity.

BMI and body image was investigated due to past research findings (as discussed in chapter 2). However, there was no effect of BMI on body satisfaction, the direction of dissatisfaction or body ideals selected in any of the studies conducted in this thesis.

In contrast, the perceived body size and not actual body size (BMI), influenced body satisfaction and choice of ideal figure throughout all of the studies (chapters 5, 6, 7 and 8), and thus had an impact on the child's self image (Holub, 2008). The children who perceived themselves as overweight or obese were the most dissatisfied with their bodies or body parts, likely because they were the furthest from the body ideals and aware of the stigma of being overweight (as discussed in chapter 2). Moreover, if the child's perception of their body did not match the stereotypical ideals for their sex, they were dissatisfied in the direction of desiring the stereotypical ideal, and this was replicated in three of the studies (chapters 5, 6 and 7). For boys, regardless of what their perceived body size was, boys wanted to be more muscular, or remain muscular if they already perceived themselves as such and the further away they were from the muscular ideal (see Thompson & Cafri, 2007; Tiggeman, 2011), the greater the direction score in the direction of desiring a more muscular body. For girls the pattern differed depending upon their perceived body. Girls who perceived their bodies as muscular, desired a less muscular body. Those who perceived their bodies as normal weight, overweight or lean desired to be lean, with some slightly (moderate) defined muscle for some of the groups. Again girls seemed to be conforming to the female body stereotype of being lean and looking physically fit (Forbes, et al, 2004; Tiggemann, 2011a).

10.6. Ethical issues and considerations across all 4 studies

The BPS (2014) ethical guidelines were followed for all of the studies (see chapter 4 for more detail). Following the Ethical approval gained from the University of Bradford Ethics Committee, 5 schools from the Leeds and Bradford area were recruited. All schools were fully informed about the study they would be involved in via an email detailing the research, its aims and the school's involvement. The researcher also visited each school before the research was conducted to discuss the study in detail and answer any questions the school had. Parents were fully informed about the studies via detailed information letters distributed to each child by the school, which gave a full explanation of the research. In addition they were kept informed throughout via an emailed newsletter and were given a contact email where they could seek further information about the research at any point if they wanted to. Individual data from their child was not reported, but parents were informed of their child's BMI percentile and weight status according to the classification of BMI into categories (underweight, healthy weight, overweight, very overweight) if requested. 31% to 34% of parents requested information about their child's BMI across the 4 studies. Confidentiality and anonymity was maintained as participants were not identifiable from the data or linked to the data collected from them. All personal data was not removed from the school environment and all data collected was protected from being obtained or misused by others through password protection.

Parents gave consent for their children to take part in research initiatives (as detailed in chapter 4) and the child's verbal assent was gained from the child on the day, either verbally or by nodding. No child who took part in the study had undiagnosed or diagnosed eating disorders, weight issues, and/or body issues and all children were assessed by their teachers as having a good understanding of spoken English and able to understand the task instructions. Less than 2% of the parents and/or children withdrew consent for participation in the study. The right to withdraw from investigations at any time was made clear to parents and children, and that this would involve removing all of the child's and/or parent's data from the

study. This only happened on one occasion where a parent requested the child's data to be removed after completion of the task.

Throughout all of the studies, the researcher took into account the young age of the children and modified procedures accordingly. Children were informed about the study by being given an age appropriate brief outline, followed by a demonstration of what to do in the task and familiarization with the materials. Due to the age of the children, it was anticipated that they would not be able to understand the intent of the study. However, they were given the choice of whether they wanted to take part in the study and were able to stop participating at any time. Verbal assent (or through the child nodding) was gained from the child before they were taken to the task area and again after demonstration of the task. The researcher was conscious of the power relations between children and adults, where within the school environment children are expected to participate in class activities. In this case, children were reminded that the researcher was not a teacher and they did not have to take part in the research if they did not wish to. They were assured that they would not get into trouble for not wanting to take part. Older or more mature younger children were given an age appropriate debrief of the study's aims and their involvement following completion of the task.

The researcher was aware that some children may feel distress during the task due to worrying about getting it 'wrong', and aiming to please. Children were encouraged to do their best, reassured there were no right or wrong answers, and were praised and encouraged throughout with 'well done', 'that's great', nods and smiles. When their involvement in the task was over, they were told that they 'tried very hard' and given a sticker 'for taking part', regardless of their performance.

During the task children were monitored for any signs of not wanting to participate through their behaviour and/or becoming upset and/or their verbal expression. The child's refusal to participate was respected and taken as a removal of their assent. Throughout all studies, only 2 children did not want to continue with the task. Any data collected from these children was destroyed. Throughout the tasks, the

researcher ensured the child fully understood what they were being asked to do through careful questioning and modelling as required. The task was designed to require minimal instructions, was visual and situated in a context familiar to the children and so these measures aided their understanding. For most children, their spontaneous comments throughout the task indicated that they understood what they were being asked to do. If any child did not fully understand the task after the explanation and demonstration, or appeared to not want to take part at any point during the activity, they were thanked for taking part in the study, given a sticker, and taken back to their classroom. Any data collected was removed. Throughout all of the studies, only 1 child's data was removed from the current/ideal task due to lack of understanding and 5 of the younger children's data from the tasks requiring the children to have developed Theory of Mind (ToM) (see chapter 6). To aid the younger children's ability to concentrate on tasks, children in studies with more than two conditions were given a break in between conditions, if the researcher observed that their attention on the task was reducing.

The researcher was sensitive to the potential psychological impact on the child of being included or excluded from taking part in the research in the form of bullying or feelings of being 'left out' from the larger cohort of children. Every care was taken to minimise this, for example, children were not told that they had been excluded from the study, but informed that the researcher only needed a small number of boys and girls from each class and that they were picked randomly. Within a school environment children are used to being included or excluded from different interventions and activities that take place in the classroom where teachers target certain cohorts of children, and so this was not expected to be different to the usual daily experience of the children. All children were given the opportunity to play with the task materials if they wished to, and were given the same sticker as the children who took part.

It is understood that there is the concern that by asking a child to think about their size/shape and their 'ideal' shape, it is introducing ideas a child may not have thought about previously. However the tasks are age appropriate and in the

context of a story or game, and it is known that some young children are already very aware of the messages transmitted about body shape and sizes. Furthermore, there is encouragement for children and parents to talk about body image. For example, there is a Government body confidence pack available for parents aimed at 6-11 year olds where parents are encouraged to talk to their children about body image and how the 'ideal' body has changed over time, with discussions around how the media alter images to fit this ideal. The researcher also recognised that some children were aware of their body size and could already hold negative feelings about it, and so may have felt uncomfortable being weighed. Therefore care was taken to ensure the measurements were taken in a private area without being observed by others.

In addition, the adults in study 4 could potentially have felt distress when answering the questions about their own BMI, or children's body size on the questionnaire. Nevertheless, the questions were not designed as probing questions and adults were informed in the information at the start of the questionnaire that they did not have to answer any question they did not wish to.

10.7. A consideration of the approach used in this thesis, strengths and limitations

This thesis took a quantitative approach, and developed a visual measure for experimental tasks which were sensitive to the age of the children. It took into account the young children's inability to deal with complex cognitive demands, their limited verbal abilities and short attention span. Through questioning and modelling of tasks, care was taken to ensure children fully understood what they were being asked to do, and children's spontaneous comments throughout the tasks suggested they understood. For these reasons, and with the replication of many of the findings throughout the studies, the approach taken was appropriate. However, it was some of the children's verbal comments around their figure selection that gave insight into their choices and prompted adaptation of the visual scales and investigation into new areas, such as exploring the impact of household exercise

within the home. For this reason, further study could combine a qualitative and quantitative approach to fully explore the development of body image in preadolescent children.

A major strength of this thesis was in using the mulitvariate analysis of variance (MANOVA) or mulitvariate analysis of covariance (MANCOVA) to analyse much of the data collected. An advantage of using this model over others is it can include all dependant variables within the same analysis and the MANOVA/MANCOVA takes account of any relationships or correlations between the dependant variables because it incorporates information about several outcome measures. In this way it has greater power than other models to identify whether groups differ along a combination of dimensions, rather than just a single dimension, as the ANOVA does (Field, 2013). In addition, using the MANOVA or MANCOVA avoids the chance of making a Type 1 error, as using multiple ANOVA's to analyse the same data could have.

There are important limitations with this research. Namely, in using a cross-sectional design, it is difficult to make any causal claims and by studying differences between age groups rather than age-related changes, the full picture of the development of negative body image in childhood is not revealed (Smolak, 2002). Future studies could employ a longitudinal design. Moreover, the limited sample size in chapter 8 meant some of the analysis was underpowered. Regardless of this, there were some significant findings and interesting results, especially around the impact of media that do warrant further investigation with a larger sample. Moreover, in two of the studies most participants were white and middle class, which does limit the generalisability of the findings. However, many of the results were replicated in the two additional studies where the samples were more ethnically diverse.

10.8. Conclusions

The work of this thesis has investigated the development of body image in preadolescent children and has made a significant contribution to the literature in this area. Most importantly it has investigated the utility of including muscularity with adiposity into a scale to measure body satisfaction and has developed an innovative measure for use with a young age group, which is necessary in order to fully explore the development of body image in children. The use of the novel measures revealed significant gender differences in body satisfaction where, in contrast to published research, boys demonstrated higher body dissatisfaction than girls. It also showed that boys and some girls desired a muscular body, and this desire was found in children much younger than reported in other quantitative studies. Furthermore, stereotypical idealised body perception was evident in very young children where boys wanted to be muscular and girls desired to be lean.

The findings of the innovative research contained within this thesis uncovered a combination of sociocultural influences, from both parents and the media, which impacted on young children's body satisfaction and choice of ideal figures. The influence of exposure to the media aimed specifically at this age group, such as playing with action figures and dressing up clothes, is not a well researched area, but the results of the current research indicate it needs to be explored more fully. The effects of age, ethnicity, BMI and perceived body size were also explored in this thesis and the results revealed that there were a combination of factors involved in the development of body image in children, which further highlights the complexity of this area of study.

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Appendix 1
Ethics forms for studies 1-4.

A1.1. Ethics form for study 1

Ethics Ref: E.284

Research Ethics Application Form
This form has been approved by the Committee for Ethics in Research

A1. Title of Research Project:

Exploring muscularity, adiposity and body dissatisfaction in young children.

A2. Contact person (normally the Principal Investigator, in the case of staff-led research projects, or the Principal Supervisor in the case of student researcher projects):

Title: Dr	First Name/Initials: Gill	Last Name: Waters
Post: Lecturer		School/Department: SSIS/Psychology
Email: g.m.waters@bradford.ac.uk		Telephone: 01274 233508

A2.1. Is this a student research project?

If yes, please provide the student's contact details and course: Yes.
Lisa Pepper, MPhil leading to PhD, SSIS/Psychology,
Email: lpepper@bradford.ac.uk

A2.2. Other key investigators/co-applicants (within/outside University), where applicable: **Please list all (add more rows if necessary)**

Title	Full Name	Post	Responsibility in project	Organisation	Department

N/A	Dr Eleanor Bryant	Lecturer	Supervisor	University of Bradford	SSIS/Psychology

A2.3 Name of body funding the project (if appropriate) and any other declarations of interest: (NOTE: *Only projects with the funding confirmed need approval)*

N/A

A3. Proposed Project Duration:

Start date: 10th June 2013	End date: 19th July 2013

Complete this form if you are a member of staff or a student who plans to undertake a research project which will not involve the NHS but which will involve people participating in research either directly (e.g. interviews, questionnaires and/or clinical study not involving NHS patients) and/or indirectly (e.g. people permitting access to data and/or tissue). **Ultimate responsibility for gaining ethical approval lies with the Principal Investigator or Principal Supervisor of the project.**

Documents to enclose with this form, where appropriate:

This form should be accompanied, where appropriate, by an Information Sheet / Covering Letter / Written Script which informs the prospective participants about the proposed research, and by a Consent Form. Applicants should also attach any unvalidated Questionnaires, Interview Guides and the full research proposal.

Further guidance on how to complete this application form is available in the document **Guidelines for Completing the Research Ethics Application form** and this can be found at :

http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/ResearchEthicsApprovalProcess/

It is essential that this form is completed with reference to the information in the application form guidance document. Please pay particular attention to completing the form in sufficient detail to allow reviewers to judge ethical issues raised by this study. The form is intended to expand to allow as much space as is needed.

For University staff and students working with NHS patients or staff, or working on NHS premises, research ethics applications should be made through an NHS Research Ethics Committee: NHS Research Ethics Committee (REC)

Once you have completed this research ethics application form in full, and other documents where appropriate, check that your name, the title of your research project and the date appears on the first page and email it to the Research Support Unit Ethics Administrator. Please keep a copy and note that the original signed and dated version of 'Part B' of the application form should also be provided to the Research Support Unit Ethics Administrator in hard copy.

Attachments

Please confirm that you have included the following documentation with your submission:

Information Sheet	YES
Consent Form	YES
Research Proposal	YES
Unvalidated Questionnaires	N/A
Interview Guidelines	N/A

Part A

A4. Mark 'X' in one or more of the following boxes if your research:

X	involves children or young people aged under 18 years
□	involves using samples of human biological material collected before for another purpose*

*Please contact the University's HTA Licence Holder, Prof Diana Anderson, [d.anderson1@bradford.ac.uk or ext. 3569] for advice.

http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Human Tissue Act

A5. Briefly summarise the project's aims, objectives and methodology (this must be in language comprehensible to a lay person)

Aims and Objectives: Research suggests that by the age of 6 to 9 years, some children have a preference for particular body shapes and sizes. However, there is a lack of research exploring weight, muscularity and body dissatisfaction with young and preadolescent children (those aged 4-11). For girls, research shows that those as young as four or five seem to show preferences for very thin bodies (Davison, Markey & Birch, 2000; McCabe et al, 2007). For boys, the research is more mixed with some preferring thinner figures, some wanting muscles and others wanting a larger figure (for example, see Ricciardelli et al, 2006). As girls and women are rarely included in body image research involving muscularity (McCreary, 2011), it is not clear whether girls share the same concerns around muscularity as boys. This research will test boys and girls in each age group to find out what proportion of girls and boys are concerned with muscularity. It is expected that boys will show a greater concern over muscles than the girls due to the previous research.

Furthermore, research investigating weight, muscularity and body dissatisfaction can be criticised for the methods used. Questionnaire methods have been employed with 8-11 year olds, but this method is not appropriate to use with younger children as they may have difficulty understanding the questions. Research seems to suggest that muscles are important to 8-9 year old boys. What is not known though is whether this may develop in younger boys and so this research will test boys and girls from ages 4 to 11 years old.

Non-questionnaire methods have been used to assess body dissatisfaction in children, but the figure rating scales usually employed focus on body fat and do not incorporate muscularity, (for e.g. Collins, 1991). Several studies have shown that some boys and their parents chose an 'ideal' figure as one that was larger than their actual body size and usually the overweight figure (Brann, 2010). What is unclear then is whether the boys and their parent's desire for a bulkier figure is actually a desire to have more body fat or to have more muscles. Cohane and Pope (2001) note that many studies fail to distinguish between the two. Limitations with the scale means it does not allow for a more muscular choice and so the boys and their parents could be choosing the overweight figure to represent a more muscular one.

Additionally, BMI needs be included in studies of body dissatisfaction as it seems to have different implications for body image (Brann, 2010; Jones and Crawford, 2005). However, the relationship between muscularity, weight and BMI remains unclear with mixed findings (e.g. see McCabe and Ricciardelli, 2003; McCabe et al, 2005).This study will measure the child's height and weight to calculate their BMI.

This research therefore aims to use an age-appropriate visual measure to clarify:

- At what age the desire for muscularity develops in boys and girls
- At what age a desire for thinness develops in boys and girls
- If there is a difference between their actual and ideal body size perception indicating body dissatisfaction and at what age this develops
- If the desire for muscularity or thinness/fatness differs over three body areas/parts

The findings of this research will aid the development of a more appropriate scale for measuring body size perception in young children and clarify whether body fat and muscularity need to be incorporated into the scale together.
Methodology:

Participants: 176 children between the ages of 4 and 11 years will be tested. Twenty two girls and twenty two boys from each age category (4-5 years old, 6-7, 8-9, 10-11) will participate from the reception school year up to year 6. If insufficient children are recruited from an age category/class then equal numbers of children across each age category will be recruited from other school(s) that have been contacted and have agreed to take part in this research.

Materials: Body parts jigsaw with three different body areas/parts selected: nine torso's, nine pairs of legs, nine pairs of arms varying in muscularity from no muscles to hyper-muscular or varying in body fat (adiposity) from very underweight to obese will be included. The same jigsaw pieces will be used due to the children now being asked to identify their actual and ideal body size and shape **now** and not when grown up- see comments 3, 4 & 5 also.

The use of three body parts allows children to combine muscularity and adiposity if they wish, for example they could select muscular arms, but not muscular legs. Plain paper cut into a head shape, pens and pencils. A voice recorder will unobtrusively record children's verbal responses. A record sheet will allow the researcher to record/score children's choices and children's verbal responses.

Study Design: The study is a cross-sectional design and will use a 2(gender: male x female) by 2(body choice: actual x ideal body) by 3(body part: Torso x pair of arms x pair of legs) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) mixed design with repeated measures on the body choice and body part factors.

Procedure: The school has given permission for their pupils to be involved in this study. Full written parental consent will be obtained from the parents and children will give their assent to take part on the day of the research. Individual children (with the above consent) will be collected from the classroom and taken to the research area. Their gender, ethnicity and date of birth will be recorded on the sheet. Children will take their shoes off and height (in centimetres) will be measured with an altimeter and weight (in Kilograms) with electronic weighing scales and recorded to enable their body mass index (BMI) to be

calculated. Previous studies have required children to take their shoes off, but remain fully clothed (Thomas et al, 2000). BMI will be calculated using the formula weight (kg)/height2 (m).

At the time of measuring children will be read aloud their height and weight as the researcher records this. BMI will not be calculated at that point and so children will not be told their BMI. On the information letter parents will be told that they can request their child's BMI by emailing the researcher. The child's BMI along with height/weight details for each BMI category will be given).

Children will take part in two conditions, the perceived 'actual' and perceived 'ideal' body size and shape. Children will be seated at a table and shown the demonstration jigsaw which comprises of a puppet torso, pair of puppet arms and pair of puppet legs. The researcher will demonstrate how the torso is placed on the table with the pair of arms and legs fitted to it. A blank head will be added and the child will be asked to draw a face on it. There will be one set of jigsaw puppet pieces due to children now being asked to identify their actual and ideal body size and shape **now** and not when grown up.

Children will be presented with a range of jigsaw pieces comprising of torsos, arms and legs arranged into three groups (by body part) but randomly arranged by size and shape within these groups. They will be encouraged to look at and pick up the pieces to familiarise themselves with them.

Condition 1: Perceived actual body size and shape:
The researcher will ask the child, 'Can you build a jigsaw of what you think you look like now?' Children will be prompted to choose a body (torso), pair of legs and arms.

As they are making their selection they will be asked:

1. 'Why did you choose that body/pair of arms, legs for your body?'
2. 'What do you like about them?'
3. 'Why didn't you choose this one/ these ones for your body?'
4. 'Which ones don't you like?'
5. 'Why don't you like them?'

Comments will be categorised into:
Q 1 & 2: The right size/ thin/ not too fat/ fat/ not too thin/ has muscles/ not have muscles/ other (this covers 'I don't know' and any other responses made).
Q. 3 & 5: Too fat/ too thin/ too many muscles/ not enough muscles/ other.
Children' responses will be recorded and be checked later with the audio recordings taken.
Q. 4: Record selection on the sheet.

Children are asked to draw a face on the blank head shaped piece of paper to add to their body.

Each body part will be scored to allow for calculation of preference of choice of adiposity (from 0 to -4) or muscularity (from 0 to +4). The separate scoring allows the researcher to identify whether the desire for muscularity or adiposity varies with different parts of the body. The body parts will be retrieved by the researcher and placed back into their groups and then all pieces shuffled around within each group (so the child cannot easily pick out the piece selected previously).

Condition 2: Perceived ideal body size and shape:
The researcher asks the child, 'Now can you build a jigsaw of what you would like to look like now? The procedure is repeated as in condition 1.

For the child's perceived actual body size the three body part scores (torso, arms, legs) will be taken separately and compared with the perceived ideal body size. The difference between the actual and ideal pairs of numbers will give a 'discrepancy index' taken to be a measure of body satisfaction/dissatisfaction (Gardner, Friedman and Jackson, 1998). As this is now comparing perceived actual body size and shape now with perceived ideal body size and shape now, it is measuring satisfaction/dissatisfaction. Scoring the dissatisfaction separately on each body part has the advantage that satisfaction/dissatisfaction with individual body parts will be revealed and not hidden within a combined score. The satisfaction/dissatisfaction score calculated would range from 0 (satisfied) to 8 (very dissatisfied) for each body part.

The researcher will enter the raw data into IBM SPSS Statistics package and it will be analysed with a 2(gender: male x female) by 2(body choice: actual x ideal body) by 3(body part: Torso x pair of arms x pair of legs) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) mixed design ANOVA with repeated measures on the body choice and body part factors. Further post hoc analyses will be carried out if necessary.

A6. Is there any potential for physical and/or psychological harm / distress to participants?

No potential for physical harm.
Addressing psychological harm: Children may feel distressed because:
1) They do not know the researcher. To minimise this, the researcher will be introduced to the class before the research and will work within the children's everyday classroom environment, so their surroundings are familiar and they will have known people nearby.

2) They do not understand the task. The task is designed to require minimal instructions, is visual and situated in a context familiar to them and so these measures will aid understanding. Children will not be pressured into doing the task and can stop if it is difficult. If the researcher feels the child does not understand, they will stop the task and tell them they have finished.

3) Some children worry about getting it 'wrong', usually aiming to please. They will be encouraged to do their best, reassured there are no right or wrong answers, will be praised and encouraged throughout with 'well done', 'that's great', nods and smiles. When

finished/ or the task is stopped they will be told they have ‘tried very hard’ and given a sticker ‘for taking part’ regardless of their performance (stickers are the standard accepted reward system used in primary schools). The researcher carrying out the study has a Disclosure and Barring Service certificate.

4) There is concern that by asking a child to think about their size/shape and their ‘ideal’ shape it is introducing ideas they may not have thought of. However research suggests this is not the case, the tasks are age appropriate, in context of a story and children will not be asked directly to pick how they want to be. Furthermore, there is a Government body confidence pack aimed at 6-11 year olds where parents are encouraged to talk to their children about body image and how the ‘ideal’ body has changed over time, with discussions around how the media alter images to fit this ideal.

A7. Does your research raise any issues of personal safety for you or other researchers involved in the project and, if yes, explain how these issues will be managed? [especially if taking place outside working hours, off University premises or outside the UK]

No. The study will take place in a school with the permission of the head teacher. The school has a strict visitor policy where access is only allowed to authorised persons and visitors sign in and out of the building. The researcher will be working within school hours 9-3:30 approximately, with the supervisor’s knowledge of the dates, times and location of the research.

For issues of personal privacy, parents and the school will be given the researcher’s University of Bradford email address and telephone number, not a personal email address or phone number.

A8.1 How will the potential participants in the project be (i) identified, (ii) approached and (iii) recruited?

Forty infant schools in the Bradford area have volunteered to participate in research with the supervisor and the University of Bradford. This followed a recruitment letter that was sent out to all LEA infant schools in the Bradford area at the beginning of 2010. Each school that volunteered has filled in a questionnaire that states the number of children in each year/stage and the possible suitable times of year for their future participation in research study. The participants for the proposed study are recruited from these 40 schools. Specifically, four schools have been contacted and asked if they would be willing to allow a study to be run at their school during June 2013. A meeting was conducted to discuss further details with three of the schools that responded. The most suitable school in terms of availability and pupil numbers has been chosen for the pilot study. At least one week before the study is due to start they will be issued with information sheets including opt out information to distribute to parents. Children will only participate in the study if their parents have signed the school’s generic consent form, have not withdrawn consent for the research study and if they themselves are willing to take part on the day of the research.

Exclusion criteria:

- Children who have been identified as having any undiagnosed/diagnosed eating disorders, weight issues and/or body issues by the school, parents, school nurse or doctor. The school will be asked to take the child's name off the class list and parents will be asked not to consent for their child to take part in the study.

- Children that will not be able to understand instructions read aloud in English or have poor spoken English where support is not available for them to take part in the study.

A8.2 Please give rationale for sample size (as appropriate):

The current study will test 176 children in total: Twenty two girls and twenty two boys from each age category (4-5 years old, 6-7, 8-9, 10-11) between the ages of 4 and 11 years old. Using GPower software it is calculated that a sample size of 152 (19 boys and 19 girls in each age category) will be sufficient for a 2x2x3x4 mixed measures design. It is expected that some children may not assent to take part in the study and so the researcher aims to recruit 22 boys and 22 girls in each age category.

A9. Will informed consent be obtained from the participants? Yes.

If informed consent or consent is not to be obtained please explain why:

Further guidance is at: http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Consent

A9.1. *This question is only applicable if you are planning to obtain informed consent:*

How do you plan to obtain informed consent? (i.e. the proposed process?):

The school has already been contacted and given information about the study and a meeting between the Deputy Head teacher and researcher has taken place. The Head teacher and Deputy have given permission for the study to take place in their school. A further information sheet will be sent to the school detailing the study. The researcher will ensure the Head Teacher includes in the generic consent process, in parent friendly language, 'any research initiatives undertaken with children in a game play or classroom scenario'. They will also state that details of the project will be sent home with the children before the research activity begins, giving parents the opportunity to either ask questions and/or withdraw their children from these activities. The researchers will check with the Head Teacher that the parents of every participating pupil have signed the generic consent form, including those who have started at the school later during that academic year.

Parents will be given an information letter and must return the opt out form if they would not like their child to take part in the study. The forms will be collected by the class teacher and handed to the researcher at the time of the research and these children will not take part in the study.

Assent/ the child's agreement will be gained on the day of the research for those children with parental consent. They will be read a script and asked if they would like to take part (see below).

A9.2 *This question is only applicable if you are planning to obtain informed consent:*

What arrangements are in place to ensure participants receive on going relevant information about the study and the opportunity to withdraw consent if required?
Consent/assent from the children will be gained to ensure that they are willing to take part and the researcher will demonstrate the task to the child. Due to their age they will not be able to understand the intent of the study; however, they will be given the choice whether they want to take part in the study and will be allowed to stop participating at any time.
On-going information about the study will be given out in an information letter as appropriate. Parents may contact me via email if they seek further information at any point. However, individual data from their child will not be reported.

A9.3 *This question is only applicable if you are planning to obtain informed consent:*
How long will the participants have to decide whether to take part in the study? (If less than 24 hours, please justify)
The information sheet with opt out form will be distributed to parents at least a week before the study is due to begin.

A9.4 *This question is only applicable if you are planning to obtain informed consent:*
Will participants be sought from one of the following groups?

- Children under 18 - YES
- People with learning disabilities
- People with a terminal illness
- People with mental health problems
- People with dementia
- Asylum seekers
- Those with a particularly dependent relationship with the researcher
- Other potentially vulnerable groups (please specify)

If yes, please state what special arrangements have been made to deal with the issues of consent for the participants above?
Please also see information stated above. My participants are children under 18. Parents or guardians will be given a full explanation of the study in an information letter and parents have the right to fill out the opt out form if they do not want their child to participate in the study.
Children will have the research and task verbally explained to them in age appropriate language. 'Assent' will be gained from the children verbally (or by nodding) on the day of the research.

The researcher will be aware that a child may not want to participate on the day and could express this verbally, through their behaviour and/or they may become upset. The child's refusal to participate is respected and taken as a removal of their assent and they will not be asked to continue with the study. Any data collected so far will be destroyed.

The researcher is also aware of the power relations between children and adults where children are expected to participate in activities in the class. Children will be reminded that I am not a teacher and that they do not have to take part in the research if they do not wish to and that they will not get into trouble for refusing to by me, their teacher, head teacher or parents.

A10. What special arrangements have been made for participants for whom English is not a first language? (If no arrangements, please explain why)

For parents identified by the school as needing support for reading letters that come home from school, I will access resources within the Primary school and University where possible to write the information letter and opt out form in parents' home language/ or interpret the letter verbally for parents that may not be able to read in their home language. I will offer to conduct a meeting for all parents who need extra support understanding the research study and giving consent which may also include English speaking parents who need support with their literacy skills (reading and signing the opt out form if they wish to).
Due to the age of the children being tested instructions for participants must be spoken. For the children participating in the research I will access support within school (where possible) to aid the understanding of the instructions given. This may include using bilingual teaching assistants/learning mentors who can explain the task in the child's home language. Where support is not available the teachers will be asked to identify any children that will not be able to understand instructions read aloud in English or have poor spoken English and these children will be excluded from the study.

A11. What steps have been taken to ensure participants have not been involved in similar study (in order to prevent over exposure) where this may be an issue?

Previous participation in any research study is unlikely due to the age of the children. In addition the supervisor is the first researcher at the University of Bradford to run psychological study such as these in local schools so it is unlikely that similar research has ever taken place. However, as a precaution schools will be asked whether the school has been involved in previous research studies of a similar nature. Schools/pupils who have participated in similar research will not be asked to take part in this research.

A12. Could this project potentially disadvantage any group of persons not included in the research?

Children who have been excluded from the study or those whose parents have removed consent will be taken from the class to the research area and given the opportunity to play with the jigsaw pieces if they wish and will be given a sticker to minimise feelings of being "left out".

A13. What measures will be put in place to ensure confidentiality and/or anonymity of personal data, where appropriate?

While the researcher will use the names of the children during the running of the study only the children's gender, date of birth (dob), height, weight and Body Mass Index (BMI) will be recorded on paper. Dob is only recorded for the purposes of calculating the child's chronological age and dob (or names) will not be included in any tables or in the analysis. The children will be given a unique number that will enable their written and audio results and BMI to be identified. This information and the resulting data from the study will be stored for a maximum of ten years by the researcher and may be published. Parents and teachers will be informed of this.

A14. Will financial / in kind payments (other than reasonable expenses and compensation for time) be offered to participants? (Indicate how much and on what basis this has been decided) No.

A15. Will the research involve the production of recorded media such as audio and/or video recordings? Yes.

A15.1. *This question is only applicable if you are planning to produce recorded media:*

How will you ensure that there is a clear agreement with participants as to how these recorded media may be stored, used and (if appropriate) destroyed?

Parents and teachers will be informed of the purpose of the audio recordings. The children's verbal responses in the study will be recorded as a secondary source of data: to find out why children have chosen particular jigsaw pieces. The audio recordings will be destroyed in the month following testing.

A16. Which institution has agreed to act as **research sponsor** for the project? (If you are conducting the research as either a student of the University of Bradford or as a researcher working on a University of Bradford research project, the University of Bradford will normally act as research sponsor. If you are conducting the research as a student or employee of another university, that institution should normally sponsor the research.)

University of Bradford

A17. Please confirm that the research sponsor has **provision in place for indemnifying the researcher** for negligent or non-negligent harm to participants? (If you are conducting the research as either a student of the University of Bradford or as a researcher working on a University of Bradford research project, such indemnity is in place. If you are conducting the research as a student or employee of another university, that institution should normally provide indemnity.)
More information available at:

http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Insurance for Research

Part B – The Signed Declaration

Title of Research Project: **Exploring muscularity, adiposity and body dissatisfaction in young children.**

I confirm my responsibility to deliver the research project in accordance with the University of Bradford's policies and procedures, which include the University's:

- '**Research Governance & Quality Assurance Code of Good Research Practice**' and the
- '**Code of Practice for Ethics in Research'** (Ethics Policy)

http://www.bradford.ac.uk/gateway/research/research-support-for academics/ethics/EthicsPolicyandStrategy/

and, where externally funded, with the terms and conditions of the research funder.

In signing this research ethics application form I am also confirming that:

- The completed form is accurate to the best of my knowledge and belief.
- The project will comply with the University's Research Ethics Policy.
- I undertake to adhere to the content and process of the project as detailed in this (and attached) documents and to inform the Panel of any changes.
- I am aware of my responsibility to be up to date and comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data, including the need to register when necessary with the appropriate Data Protection Officer (currently the responsibility of Professor Geoff Layer) and the HTA Designated Individual (Professor Diana Anderson).
- I understand that the project, including research records and data, may be subject to inspection for audit purposes, if required in future and that these records will be stored for a period of 10 years from the end of the project.
- I understand that personal data about me as a researcher in this form will be held by those involved in the ethics review procedure (e.g. the Research

Support Unit Ethics Administrator and/or Ethics Reviewers) and that this will be managed according to Data Protection Act principles.

- If this is an application for a 'generic' project all the individual projects that fit under the generic project are compatible with this application.

Name of the **Principal Investigator** (or the name of the **Principal Supervisor** if this is a student research project):

…..... Dr Gill Waters ……

Signature of **Principal Investigator** (or the **Principal Supervisor**):

…… **……** Date: **……27/03/2013……...**

Please email the completed application form and provide a signed, hard copy of 'Part B' to the Research Support Unit Ethics Administrator (also enclose, if relevant, any supporting documents).

A1.2. Ethics form for studies 2 and 3

Ethics Ref: E.372

Research Ethics Application Form

This form has been approved by the Committee for Ethics in Research

A1. Title of Research Project: **Gender stereotypes around body shapes that incorporate muscularity and adiposity.**

A2. Contact person (normally the Principal Investigator, in the case of staff-led research projects, or the Principal Supervisor in the case of student researcher projects):

Title: Dr	First Name/Initials: Gill	Last Name: Waters
Post: Lecturer	School/Department: SSIS/Psychology	
Email: g.m.waters@bradford.ac.uk	Telephone: 01274 233508	

A2.1. Is this a student research project?

If yes, please provide the student's contact details and course: Yes.

Lisa Pepper, MPhil leading to PhD, SSIS/Psychology

Email: lpepper@bradford.ac.uk

A2.2. Other key investigators/co-applicants (within/outside University), where applicable:
Please list all (add more rows if necessary)

Title	Full Name	Post	Responsibility in project	Organisation	Department
N/A	Dr Eleanor Bryant	Lecturer	Supervisor	University of Bradford	SSIS/Psychology

A2.3 Name of body funding the project (if appropriate) and any other declarations of interest: (NOTE: *Only projects with the funding confirmed need approval)*

N/A

A3. Proposed Project Duration:

Start date: 19th May 2014	End date: 22nd July 2014

Complete this form if you are a member of staff or a student who plans to undertake a research project which will not involve the NHS but which will involve people participating in research either directly (e.g. interviews, questionnaires and/or clinical study not involving NHS patients) and/or indirectly (e.g. people permitting access to data and/or tissue). **Ultimate responsibility for gaining ethical approval lies with the Principal Investigator or Principal Supervisor of the project.**

Documents to enclose with this form, where appropriate:

This form should be accompanied, where appropriate, by an Information Sheet / Covering Letter / Written Script which informs the prospective participants about the proposed research, and by a Consent Form. Applicants should also attach any unvalidated Questionnaires, Interview Guides and the full research proposal.

Further guidance on how to complete this application form is available in the document **Guidelines for Completing the Research Ethics Application form** and this can be found at :

http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/ResearchEthicsApprovalProcess/

It is essential that this form is completed with reference to the information in the application form guidance document. Please pay particular attention to completing the form in sufficient detail to allow reviewers to judge ethical issues raised by this study. The form is intended to expand to allow as much space as is needed.

For University staff and students working with NHS patients or staff, or working on NHS premises, research ethics applications should be made through an NHS Research Ethics Committee: NHS Research Ethics Committee (REC)

Once you have completed this research ethics application form in full, and other documents where appropriate, check that your name, the title of your research project and the date appears on the first page and email it to the Research Support Unit Ethics Administrator. Please keep a copy and note that the original signed and dated version of 'Part B' of the application form should also be provided to the Research Support Unit Ethics Administrator in hard copy.

Attachments

Please confirm that you have included the following documentation with your submission:

Information Sheet	YES
Consent Form	YES
Research Proposal	YES
Unvalidated Questionnaires	N/A
Interview Guidelines	N/A

Part A

A4. Mark 'X' in one or more of the following boxes if your research:

X involves children or young people aged under 18 years

□ involves using samples of human biological material collected before for another purpose*

*Please contact the University's HTA Licence Holder, Prof Diana Anderson, [d.anderson1@bradford.ac.uk or ext. 3569] for advice.

http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Human Tissue Act

A5. Briefly summarise the project's aims, objectives and methodology

(this must be in language comprehensible to a lay person)

Aims and Objectives: This research is proposed to follow on from an earlier PhD study where the role of muscularity, adiposity (body fat) and other contributory factors were investigated in relation to body dissatisfaction in children. In the previous study even the youngest children made comments about different sized and shaped bodies. Their comments seemed to demonstrate an awareness of a stereotype that exists about what male and female bodies should look like:

Gender	Age	Comment
Girl	4	'I don't want muscles. Those arms have no muscles and girls don't have muscles'
Girl	6	'Girls have skinny legs'
Girl	7	'Ladies don't have as many muscles as men. Boys and men have muscles'
Boy	6	'I want that one (torso with muscular definition) because it looks a bit boyish'

Children do appear to have an idea about what body shapes are desirable and a preference for a particular amount of body fat and/or muscle for male or female bodies could therefore develop at an early age. Girls usually choose a figure that is thinner than their actual body size for themselves (McCabe et al, 2007) and a few studies reveal that some girls desire muscles (see Ricciardelli et al, 2003). In addition, boys also choose thinner bodies (Gardner et al, 1999), with a desire to increase their muscularity (Ricciardelli et al, 2006). These choices could be due to the influence of societal ideals of body shape and size which portray the 'ideal' man as lean, with a muscular V-shaped body type and six-pack abdominal muscles (Tiggeman, 2011) and women as looking very thin (Thompson et al, 1999) and physically fit (Forbes, et al, 2004). Although muscular toning seems important for men and women, Hobson's (2002) research with adults found that too much muscle on women is not desirable. Hyper-muscular females were viewed as unfeminine (Forbes et al, 2004).

Ideals about how bodies should look are communicated to children through the mass media (e.g. cartoons), family and peers and toys. Dolls such as Barbie and action figures display largely unhealthy and unrealistic body shapes which can induce a feeling of body dissatisfaction in some children (Dittmar et al, 2006). Body dissatisfaction can lead to problem eating attitudes and behaviours as reported in 6-8 year olds (Kelly et al, 1999). Shapiro et al (1997) found some 8-10 year old boys and girls were employing behaviours such as dieting and exercise to control their weight. Concerns about body fat and dieting increase with age and some girls hold anorectic eating attitudes before adolescence (Maloney et al, 1989). Fully understanding the development of these ideals then will be useful in developing early interventions with young children.

Furthermore, women and men may have a distorted view of the figure they perceive as an 'ideal' which could impact on the perception of their own body. For example, mothers, fathers and daughters all thought they were heavier than their ideal body in Rozin and Fallon's (1988) study. Women seem to overrate preferences for thinner figures, despite a preference for a more rounded figure by female peers (Cohn and Adler, 1992) and by men (Cohn and Adler, 1992; Fallon and Rozin, 1985). Men appear to overestimate the muscularity chosen by male peers (Cohn and Adler, 1992) and body fat chosen by the opposite sex, with women preferring a thinner figure than men selected themselves (Fallon and Rozin, 1985). This type of research has not often been conducted with children, but Cohn et al, (1987) found 10-15 year old girls and boys had similar misjudgements about opposite sex preferences as found in the adult research. Younger girls (aged 7-11 years) also rated their ideal figure as significantly thinner than the one they perceived as attractive to boys (Tiggemann & Wilson-Barrett, 1998). We do not fully know, however, how 'ideals' around muscles are viewed by children. Moreover, we know the ideal body types girls and boys choose for themselves, but not which body shape children perceive as an ideal shape for an adult or for a child of the opposite sex.

With these preferences for thinner and/or muscular ideals, unsurprisingly our society holds negative attitudes towards overweight individuals (Rothblum, 1992) with evidence of the development of these attitudes during preschool years (Musher-Eisenman et al, 2003;

Spiel et al, 2012). The negative attitudes held by children are likely to influence their beliefs around acceptable body sizes (Tiggemann & Pennington, 1990). Very young children from the age of 3 have some awareness of the anti-fat stereotype and this bias seems to increase with age (Musher-Eisenman et al, 2003; Spiel et al, 2012). Many young girls know it is not desirable to be fat (Cramer and Steinwert, 1998) and girls as young as 8 years old fear becoming fat (Shapiro et al, 1997). Consequences of this stereotyping include poor body perception (Cramer & Steinwert, 1998) and peer rejection. For example, when an underweight, average weight and overweight figure is presented to a child and they are asked which one they would like to be friends with and why, the overweight figure is perceived as the most mean, and most children prefer the underweight and average body weight figures to have as a friend (Musher-Eizenman et al, 2004). Overweight builds are also described more negatively on physical (e.g. strong-weak), personal (kind-mean) and social characteristics (has many friends-few friends) (Musher-Eizenman et al, 2004; Spiel et al, 2012).

The role of age and gender on weight attitudes needs to be clarified as research reveals mixed findings. Cramer and Steinwert (1998) found no difference in boys' and girls' anti-fat attitudes. However, in Brylinsky & Moore's (1994) study, girls rated the underweight figure more favourably than boys did and Palmer and Rutland (2011) found 5-11 year old girls preferred the underweight to average or overweight figures. Furthermore, both younger boys and girls (aged 5-7) chose the underweight figure over the others to be their friend in this study.

Again, body fat has been researched extensively, but there are few studies that explore attributes/adjectives assigned to muscular figures, so we know little about this. Forbes et al (2004) found that men and women viewed hyper-muscular women, as compared to an average build, more negatively in characteristics such as intelligence and social popularity, but more positively on others, such as honesty. The male muscular body types were given desirable attributes such as brave, honest and popular in Butler et al's (1993) research. However, there are problems with this area of research: the degree of muscularity of the figures is not always reported and few studies use female participants, less so children.

This research proposal is for two studies that aim to fill some of the gaps in the existing literature by firstly investigating young children's perception of the 'ideal' body shape (incorporating both muscularity and adiposity/body fat) for different groups of males/females in order to explore whether a stereotype exists for children around how male and female bodies should look. Secondly to extend the attributes research based on body fat to incorporate muscularity and explore attributes assigned by children to figures varying in muscularity and body fat.

Study 1 aims to find out:

- The ideal body shape (in terms of muscularity and adiposity) chosen by children for a typical girl, boy, woman and man

- How the ideal body shape chosen varies by the child's age, gender, BMI, perceived body size and current level of body satisfaction/dissatisfaction
- The ideal body shape children would like to have when they are an adult
- The ideal body shape children perceive a child of the opposite sex will choose for them (their sex) (For example, what will a boy choose as an 'ideal' girl body shape?)
- When a child is asked to choose the ideal body shape they think the opposite sex would choose for their sex, does this match the ideal actually chosen? (For example, does the figure a girl thinks a boy will choose as an ideal girl match the figure he chose?)
- When a child is asked to choose the ideal body shape they think the opposite sex would choose for their sex, does this match the ideal they choose for themselves? (For example, does the figure a girl thinks a boy will choose as an ideal girl match the figure she chose for herself?)

Methodology: *Participants*: Children between the ages of 4 and 11 years will be tested (N=184). 23 girls and 23 boys from each age category (4-5 6-7, 8-9, 10-11 years old). Participants will be recruited from two primary schools in the Leeds area, West Yorkshire. Equal numbers of children will be recruited across each age category from both schools. If insufficient children are recruited from an age category/class then equal numbers of children across each age category will be recruited from other school(s) that have been contacted and have agreed to take part in this research.

Materials: 4 sets (girl, boy, woman, man) of 5 picture cards. The figures on the cards vary by muscularity and adiposity and so comprise of a thin/underweight, average/healthy weight, overweight, muscular and hyper-muscular figure numbered 1-5 on the back. A voice recorder will unobtrusively record children's verbal responses. A record sheet will allow the researcher to record/score children's choices and children's verbal responses.

Study Design: A cross-sectional design.
Ideal body shape for girl/boy/woman/man: 2(gender: male x female) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by 5(body size) by 4(sex/age: boy,girl,man,woman) mixed design ANOVA with repeated measures on the body size and sex/age of figures.

Body satisfaction/dissatisfaction: 2(gender: male x female) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by 2(body choice: actual x ideal body) mixed design ANOVA with repeated measures on the body choice factor.

Child's perceived ideal opposite sex will choose for child's own sex: 2(gender: male x female) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by 5(body size).

Procedure: The schools have given permission for their pupils to be involved in this study. At least one week before the study is due to start parents will be issued with information sheets including opt out information. Children will only participate in the study if their parents have signed the school's generic consent form, have not withdrawn consent for the research study and if they themselves are willing to take part on the day of the research.

Individual children will be collected from the classroom and taken to a quiet area of the school. The script for verbal consent will be read out. If they agree to take part in the study their gender, ethnicity and age in months will be recorded on the sheet. Their names will not be noted. Children will take their shoes off and their height will be measured (in centimetres) with an altimeter and their weight will be measured (in Kilograms) with electronic weighing scales. The measurements will be read aloud to the children. The measurements will be recorded to enable their body mass index (BMI) to be calculated at a later date. BMI will be calculated using the formula weight (kg)/height2 (m). Parents who have requested to be informed of their child's BMI category (by signing and returning the slip on the letter) will have it reported to them via email. A large proportion of parents requested this information in the previous study.

The researcher will read the procedure script and lay out a set of the cards in random order on the table. The child will be encouraged to look at and pick up the cards to familiarise themselves with them. The presentation order of the 4 sets of cards will counterbalanced to prevent order effects. Children will be asked 12 questions in relation to the corresponding set of cards being displayed:
Same sex child cards (Children are asked to pick **one** card only)

- *Which picture looks most like you?* (Current self- Self-identification question used to assess a child's attitude towards their own body)
- *Which picture would you most like to look like?* (Ideal self)
- *Which picture would you **not** like to look like?* (Averted self)

Opposite or same sex child cards

- *Which picture shows what you think a girl should look like?*
- *Which picture shows what you think a boy should look like?*
- *(Girl participant) Which picture do you think boys think girls should look like?*
- *(Boy participant) Which picture do you think girls think boys should look like?*

Opposite or same sex adult cards

- *Which picture shows what you think a woman should look like?*
- *Which picture shows what you think a man should look like?*
- *Which picture shows what you would like to look like when you are older?*
- *Which picture shows what you would not like to look like when you are older?*
- *(Girl participant) Which picture do you think boys think a woman should look like?*
- *(Girl participant) Which picture do you think boys think a man should look like?*
- *(Boy participant) Which picture do you think girls think a woman should look like?*

- *(Boy participant) Which picture do you think girls think a man should look like?*

The task requires a non-verbal response and children are encouraged to point to **one** card only after each question. If children point to more than one card, the cards will be rearranged on the table and the child will be reminded to choose **one** card and asked the relevant question again. Children's choices will be written down on the record sheet. Children will be asked *why* they have made their selection, but do not need to respond if they do not wish to. A voice recorder will unobtrusively record children's verbal responses.

Study 2 aims to find out:

- The attributes (adjectives) assigned to figures differing in adiposity and muscularity
- Which figures are chosen for positive and negative attributes
- Which figures are chosen to be friends, best friends or chosen not to be friends
- Whether friendship selection varies by the child's gender, age, BMI group, perceived body size and level of body dissatisfaction
- Whether the attributes assigned to the figures varies by the child's gender, age, BMI group, perceived body size and level of body dissatisfaction

Pilot study: A pilot study will be conducted initially to generate a list of attributes/adjectives for figures varying in muscularity and adiposity because (to the author's knowledge) there are no studies that have used muscular figures in this type of research with children. *Participants:* 18 girls and 18 boys aged 9-11 years old will be randomly selected from the school where study 1 was carried out. *Materials:* The card sets from study 1. *Procedure:* Same sex children will be invited in groups of 3 to take part in the study (see study 1). Each group will be given one set of 5 cards from study 1 (equal numbers of children from both sexes will look at each set). Groups will be shown one figure at a time and asked questions about each one. Questions will be asked to elicit physical, personal and social attributes as in previous stereotypes research (for example, see Lerner & Korn, 1972). Children will be asked:

- ***What words can you use to describe this figure?***
- *Prompts: Which words describe what they look like?*
- *What do you think their personality is like?*
- *What sorts of things do you think they do?*
- *Can you describe how they are with other people?*
- *Is there anything else you would like to say about them?*

A voice recorder will unobtrusively record children's verbal responses. Voice recordings are taken as a back up to the record sheet and to provide insight into children's choices. All recordings will be deleted within one month of the study. Key attributes identified will be listed on a sheet of paper by the researcher. Children will be read these and asked if

they think they describe the character well. Additions/alterations will be made if the children suggest them.

Attributes will be listed and synonyms removed. It is anticipated the attributes for the figures varying in adiposity will be similar to those used in body size (weight) stereotypes research (see Lerner & Korn, 1972), and some of the attributes assigned to the figures varying in muscularity may also be similar to those used in this research (for example, strong-weak). A total of 10 attributes will be selected to represent figures varying in adiposity and muscularity. Attributes will be paired with their opposite, so for example strong will be paired with weak, kind with mean, friendly with unfriendly etc.

Study 2: *Participants*: Children between the ages of 4 and 11 years will be tested (N= 152). 19 girls and 19 boys from each age category (4-5 6-7, 8-9, 10-11 years old,) will participate from the reception school year up to year 6. Using GPower software it is calculated that a sample size of 152 (19 boys and 19 girls in each age category) will be sufficient for a 2x4x5x2 mixed measures design. It is anticipated that some children may not assent to take part in the study and so the researcher aims to approach 21 boys and 21 girls in each age category. Participants will be recruited from a different primary school (to study 1) in the Leeds area, West Yorkshire.

Materials: 4 sets of 5 picture cards will be used. The researcher will use the girl and boy sets of picture cards from study 1. A further girl and boy set will be made repeating the same body shapes as study 1, but using a different hair style, hair colour, facial feature for the set. The figures on the cards comprise of a thin, average sized, chubby, muscular and hyper-muscular figure numbered 1-5 on the back.

The researcher will make a story book where the children will be read text about characters and will be asked to select one of the figures they think the story is about. The book will include illustrations to accompany the story. The text will be based around the attributes generated for the figures in the pilot study. For example, the researcher may read about a character being very brave, the child is asked to pick the card which they think shows the brave character.

A voice recorder will unobtrusively record children's verbal responses. A record sheet will allow the researcher to record/score children's choices. Research area: A quiet side room/shared space close to or within the child's classroom.

Study Design: The study is a cross-sectional design.

Body satisfaction/dissatisfaction: 2(gender: male x female) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by 2(body choice: actual x ideal body) mixed design ANOVA with repeated measures on the body choice factor.

Friendship selection: 2(gender: male x female) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by 5(body size) with repeated measures on the body size factor.

Attributions: 2(gender: male x female) by 4(age: 4-5 years x 6-7 years x 8-9 years x 10-11 years) by 5(body size) with repeated measures on the body size factor.

Procedure: Consent as study 1.

Individual children (with the above consent) will be collected from the classroom and taken to a quiet area of the school. The script for verbal consent will be read out. If they agree to take part in the study their gender, ethnicity and date of birth will be recorded on the sheet. Their names will not be noted. Children will take their shoes off and their height will be measured (in centimetres) with an altimeter and their weight will be measured (in Kilograms) with electronic weighing scales. BMI will be calculated using the formula weight (kg)/height2 (m) (See Study 1).

Body size satisfaction/dissatisfaction: The researcher will read the procedure script and lay out 1 set of the same sex child cards in random order on the table. The child will be encouraged to look at and pick up the cards to familiarise themselves with them. Children will be asked:

- *Which picture looks most like you?* (Current self)
- *Which picture would you most like to look like?* (Ideal self)

Children's choices will be recorded on the record sheet.

Friendship selection: Children will be presented with a random arrangement of the 5 boy and 5 girl cards (sets from study 1) placed on the table in front of them. They will be asked:

- *Can you choose the children you would like to play with?*

The children are encouraged to pick as many cards as they like. The sex and number of the cards will be recorded. The cards will then be randomly placed back in the arrangement and the child will be asked:

- *Can you choose the children you would **not** like to play with?*

The cards will then be randomly placed back in the arrangement and the child will be asked:

- *Can you choose **one** child you would like to play with and have as your best friend?*

The number of the card will be recorded on the record sheet. Children will be asked *why* they have made their selection, but do not need to respond if they do not wish to. A voice recorder will unobtrusively record children's verbal responses.

Attributes: Children will be presented with a random arrangement of 2 sets of the cards matching the child's own sex. The researcher will read the storybook and pause at points in the story. The attributes included in the storybook will be developed from those identified

in the pilot study, so exact storyline and questions cannot be identified at this time. However, the story and questions will follow a similar format to those below:

(The story book will show a picture of the tree fallen across the path for the children to look at as the story is read.) *Example story: Two boys were playing in the woods when they came across part of a fallen tree blocking their path. They would have to move the tree otherwise they would need to turn around and walk back the way they had come. They knew there were some good trees to climb further down the path, so they didn't want to go back yet. One of the boys tried to move the tree. He pulled on one of the branches, but it was no good it was just too heavy for him. It didn't move a bit. Before they decided to turn back, the other boy said he would have a go. He grabbed one of the branches and slowly managed to pull the tree out of the way so that there was a small gap they would be able to squeeze through...*

Children will be asked:

- *Which character do you think is the* strong person in *the story?*
- *Which character do you think is the* weak person in *the story?*

This will be repeated throughout the story with the pairs of attributes identified in the pilot study. The card set (adult or child) and number of the card will be recorded on the record sheet. Children will be asked *why* they have made their selection, but do not need to respond if they do not wish to. A voice recorder will unobtrusively record children's verbal responses. Voice recordings are taken as a back up to the record sheet and to provide insight into children's choices. All recordings will be deleted within one month of the study.

A6. Is there any potential for physical and/or psychological harm / distress to participants?

No potential for physical harm.

Addressing psychological harm: Children may feel distressed because:

1) They do not know the researcher. To minimise this, the researcher will be introduced to the class before the research and will work within the children's everyday classroom environment, so their surroundings are familiar and they will have known people nearby.

2) They do not understand the task. The task is designed to require minimal instructions, is visual and situated in a context familiar to them and so these measures will aid understanding. Children will not be pressured into doing the task and can stop if it is difficult. If the researcher feels the child does not understand, they will stop the task and tell them they have finished.

3) Some children worry about getting it 'wrong', usually aiming to please. They will be encouraged to do their best, reassured there are no right or wrong answers, will be praised and encouraged throughout with 'well done', 'that's great', nods and smiles. When finished/ or the task is stopped they will be told they have 'tried very hard' and given a sticker 'for taking part' regardless of their performance (stickers are the standard accepted reward system used in primary schools). The researcher carrying out the study has a Disclosure and Barring Service certificate.

4) There is concern that by asking a child to think about their size/shape and their 'ideal' shape it is introducing ideas they may not have thought of. However research suggests this is not the case, the tasks are age appropriate and in the context of a story. Furthermore, there is a Government body confidence pack aimed at 6-11 year olds where parents are encouraged to talk to their children about body image and how the 'ideal' body has changed over time, with discussions around how the media alter images to fit this ideal.

A7. Does your research raise any issues of personal safety for you or other researchers involved in the project and, if yes, explain how these issues will be managed? [especially if taking place outside working hours, off University premises or outside the UK]

No. The study will take place in a school with the permission of the head teacher. The school has a strict visitor policy where access is only allowed to authorised persons and visitors sign in and out of the building.

The researcher will be working within school hours 9-3:30 approximately, with the supervisor's knowledge of the dates, times and location of the research. For issues of personal privacy, parents will be given the researcher's University of Bradford email address and telephone number, not a personal email address or phone number. The school will be given the researcher's University of Bradford email address and mobile telephone number.

A8.1 How will the potential participants in the project be (i) identified, (ii) approached and (iii) recruited?

Forty infant schools in the Bradford area have volunteered to participate in research with the supervisor and the University of Bradford. This followed a recruitment letter that was sent out to all LEA infant schools in the Bradford area at the beginning of 2010. Each school that volunteered has filled in a questionnaire that states the number of children in each year/stage and the possible suitable times of year for their future participation in research study. The participants for the proposed study are recruited from these 40 schools. Last year, four schools were contacted and one was recruited for the study conducted in June 2013. This year a further three have been contacted and asked if they would be willing to allow a study to be run in their school during May-July 2014. A meeting was conducted to discuss further details with three of the schools that responded. The most suitable schools in terms of availability and pupil numbers have been chosen for the

two studies. At least one week before the study is due to start they will be issued with information sheets including opt out information to distribute to parents. Children will only participate in the study if their parents have signed the school's generic consent form, have not withdrawn consent for the research study and if they themselves are willing to take part on the day of the research.

Children with the following exclusion criteria will not participate in the study:

- The researcher is not making a diagnosis or asking parents/schools to do so, but if a parent feels their child is overly concerned with the size or shape of their body (for example, they may regularly make negative comments about their appearance or weight) or may be under or over eating, they are asked to consider whether they should withdraw their consent for the child to take part in the study. It is felt that measuring a child's weight could be distressing for the child if they already have concerns about their body. Parents may email the researcher to ask for more details of the research or for their opinion about participation. If teachers/the school hold similar concerns for particular children they are asked to consider whether the child should take part.
- Children who have been identified as having a diagnosed eating disorder, weight issue and/or body issue by a nurse or doctor will not be able to take part in this study.
- The school will be asked to take the child's name off the class list and parents will be asked not to consent for their child to take part in the study.
- Children who will not be able to understand instructions read aloud in English or have poor spoken English where support is not available for them to take part in the study.

A8.2 Please give rationale for sample size (as appropriate):

Study 1 will test 184 children in total: Using GPower software it is calculated that a sample size of 184 (23 boys and 23 girls in each age category, 4-5, 6-7, 8-9, 10-11 years old) will be sufficient for a 2x4x5x4 mixed measures design. It is expected that some children may not assent to take part in the study and so the researcher aims to approach 25 boys and 25 girls in each age category.

Study 2 will test 152 children in total: Using GPower software it is calculated that a sample size of 152 (19 boys and 19 girls in each age category) will be sufficient for a 2x4x5x2 mixed measures design. It is anticipated that some children may not assent to take part in the study and so the researcher aims to approach 21 boys and 21 girls in each age category.

A9. Will informed consent be obtained from the participants? Yes.

If informed consent or consent is not to be obtained please explain why:

Further guidance is at: http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Consent

A9.1. *This question is only applicable if you are planning to obtain informed consent:*

How do you plan to obtain informed consent? (i.e. the proposed process?): The schools have already been contacted and given information about the study and a meeting between the Deputy Head teacher and researcher is taking place. The Head teacher and Deputy have given permission for the study to take place in their school. A further information sheet will be sent to the school detailing the study.

The researcher will ensure the Head Teacher includes in the generic consent process, in parent friendly language, 'any research initiatives undertaken with children in a game play or classroom scenario'. They will also state that details of the project will be sent home with the children before the research activity begins, giving parents the opportunity to either ask questions and/or withdraw their children from these activities. The researcher will check with the Head Teacher that the parents of every participating pupil have signed the generic consent form, including those who have started at the school later during that academic year.

Parents will be given an information letter and must return the opt out form if they would not like their child to take part in the study. The forms will be collected by the class teacher and handed to the researcher at the time of the research and these children will not take part in the study. Parents will be informed about the research again in the school's weekly information letters to parents or on the school website (as applicable).

Assent/ the child's agreement will be gained on the day of the research for those children with parental consent. They will be read a script and asked if they would like to take part (see below).

A9.2 *This question is only applicable if you are planning to obtain informed consent:*

What arrangements are in place to ensure participants receive on going relevant information about the study and the opportunity to withdraw consent if required?

Consent/assent from the children will be gained to ensure that they are willing to take part and the researcher will demonstrate the task to the child. Due to their age they will not be able to understand the intent of the study; however, they will be given the choice whether they want to take part in the study and will be allowed to stop participating at any time.

On-going information about the study will be given out in an information letter as appropriate. Parents may contact me via email if they seek further information at any point. However, individual data from their child will not be reported, other than their child's BMI category if requested.

A9.3 *This question is only applicable if you are planning to obtain informed consent:*

How long will the participants have to decide whether to take part in the study? (If less than 24 hours, please justify)

The information sheet with opt out form will be distributed to parents at least a week before the study is due to begin.

A9.4 *This question is only applicable if you are planning to obtain informed consent:*
Will participants be sought from one of the following groups?

- Children under 18 - YES
- People with learning disabilities
- People with a terminal illness
- People with mental health problems
- People with dementia
- Asylum seekers
- Those with a particularly dependent relationship with the researcher
- Other potentially vulnerable groups (please specify)

If yes, please state what special arrangements have been made to deal with the issues of consent for the participants above?

Please also see information stated above. My participants are children under 18. Parents or guardians will be given a full explanation of the study in an information letter and parents have the right to fill out the opt out form if they do not want their child to participate in the study. The researcher will keep a record of any parents not giving consent or withdrawing their children from the study after giving consent, but before the study.

Children will have the research and task verbally explained to them in age appropriate language. 'Assent' will be gained from the children verbally (or by nodding) on the day of the research.

The researcher will be aware that a child may not want to participate on the day and could express this verbally, through their behaviour and/or they may become upset. The child's refusal to participate is respected and taken as a removal of their assent and they will not be asked to continue with the study. Any data collected so far will be destroyed.

The researcher is also aware of the power relations between children and adults where children are expected to participate in activities in the class. Children will be reminded that I am not a teacher and that they do not have to take part in the research if they do not wish to and that they will not get into trouble for refusing to by me, their teacher, head teacher or parents.

A10. What special arrangements have been made for participants for whom English is not a first language? (If no arrangements, please explain why)

For parents identified by the school as needing support for reading letters that come home from school, I will access resources within the Primary school and University where possible to write the information letter and opt out form in parents' home language/ or interpret the letter verbally for parents that may not be able to read in their home language. I will offer to conduct a meeting for all parents who need extra support understanding the research study and giving consent which may also include English speaking parents who need support with their literacy skills (reading and signing the opt out form if they wish to).

Due to the age of the children being tested instructions for participants must be spoken. For the children participating in the research I will access support within school (where possible) to aid the understanding of the instructions given. This may include using bilingual teaching assistants/learning mentors who can explain the task in the child's home language. Where support is not available, the teachers will be asked to identify any children that will not be able to understand instructions read aloud in English or have poor spoken English and these children will be excluded from the study.

A11. What steps have been taken to ensure participants have not been involved in similar study (in order to prevent over exposure) where this may be an issue?

Previous participation in any research study is unlikely due to the age of the children. In addition the supervisor is the first researcher at the University of Bradford to run psychological study such as these in local schools so it is unlikely that similar research has ever taken place. However, as a precaution schools will be asked whether the school has been involved in previous research studies of a similar nature. Schools/pupils who have participated in similar research will not be asked to take part in this research.

A12. Could this project potentially disadvantage any group of persons not included in the research?

Children who have been excluded from the study or those whose parents have removed consent will be taken from the class to the research area and given the opportunity to play with the cards and materials if they wish and will be given a sticker to minimise feelings of being "left out".

The researcher acknowledges that there could be a psychological and detrimental effect on children, for being included or excluded, in the form of bullying from the larger cohort of children. Steps have been taken to minimise this: Children are told that the researcher only needs a small number of boys and girls from each class and that they are picked randomly. If they do not have the chance to be picked they can still come and have a look at/play with the materials used and will receive a sticker. Children are not told that they have been excluded from the study. Within a school environment children are used to being included or excluded from different interventions and activities that take place in the

classroom where teachers target certain cohorts of children, and so this is not different to the usual daily experience of the children.

A13. What measures will be put in place to ensure confidentiality and/or anonymity of personal data, where appropriate?

While the researcher will use the names of the children during the running of the study only the children's gender, age in months, height, weight and Body Mass Index (BMI) will be recorded on paper. Any class lists used will remain in school (locked in the office) at the end of each day. The children will be given a unique number that will enable their written and audio results and BMI to be identified. This information and the resulting data from the study will be stored for a maximum of ten years by the researcher and may be published. Parents, teachers and schools will be informed of this.

A14. Will financial / in kind payments (other than reasonable expenses and compensation for time) be offered to participants? (Indicate how much and on what basis this has been decided) No.

A15. Will the research involve the production of recorded media such as audio and/or video recordings? Yes.

A15.1. *This question is only applicable if you are planning to produce recorded media:*

How will you ensure that there is a clear agreement with participants as to how these recorded media may be stored, used and (if appropriate) destroyed?

Parents and teachers will be informed of the purpose of the audio recordings. The children's verbal responses in the study will be recorded as a secondary source of data to find out why children have or have not chosen particular picture cards. The audio recordings will be destroyed in the month following testing.

A16. Which institution has agreed to act as **research sponsor** for the project? (If you are conducting the research as either a student of the University of Bradford or as a researcher working on a University of Bradford research project, the University of Bradford will normally act as research sponsor. If you are conducting the research as a student or employee of another university, that institution should normally sponsor the research.)
University of Bradford

A17. Please confirm that the research sponsor has **provision in place for indemnifying the researcher** for negligent or non-negligent harm to participants? (If you are conducting the research as either a student of the University of Bradford

or as a researcher working on a University of Bradford research project, such indemnity is in place. If you are conducting the research as a student or employee of another university, that institution should normally provide indemnity.)
More information available at:

http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Insurance for Research

Part B – The Signed Declaration

Title of Research Project: Gender stereotypes around body shapes that incorporate muscularity and adiposity.

I confirm my responsibility to deliver the research project in accordance with the University of Bradford's policies and procedures, which include the University's:

- '**Research Governance & Quality Assurance Code of Good Research Practice**' and the
- '**Code of Practice for Ethics in Research'** (Ethics Policy)

http://www.bradford.ac.uk/gateway/research/research-support-for academics/ethics/EthicsPolicyandStrategy/

and, where externally funded, with the terms and conditions of the research funder.

In signing this research ethics application form I am also confirming that:

- The completed form is accurate to the best of my knowledge and belief.
- The project will comply with the University's Research Ethics Policy.
- I undertake to adhere to the content and process of the project as detailed in this (and attached) documents and to inform the Panel of any changes.
- I am aware of my responsibility to be up to date and comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data, including the need to register when necessary with the appropriate Data Protection Officer (currently the responsibility of Professor Geoff Layer) and the HTA Designated Individual (Professor Diana Anderson).
- I understand that the project, including research records and data, may be subject to inspection for audit purposes, if required in future and that these records will be stored for a period of 10 years from the end of the project.
- I understand that personal data about me as a researcher in this form will be held by those involved in the ethics review procedure (e.g. the Research Support Unit Ethics Administrator and/or Ethics Reviewers) and that this will be managed according to Data Protection Act principles.

- If this is an application for a 'generic' project all the individual projects that fit under the generic project are compatible with this application.

Name of the **Principal Investigator** (or the name of the **Principal Supervisor** if this is a student research project):

…..... Dr Gill Waters ……

Signature of **Principal Investigator** (or the **Principal Supervisor**):

…… …… Date: **……26/03/14……...**

A1.4. Ethics form for study 4

Ethics Ref: E441

Research Ethics Application Form

This form has been approved by the Committee for Ethics in Research

A1. Title of Research Project: **Investigating sociocultural (media and parental) influences on boys' body satisfaction and desire for a muscular body**

A2. Contact person (normally the Principal Investigator, in the case of staff-led research projects, or the Principal Supervisor in the case of student researcher projects):

Title: Dr	First Name/Initials: Eleanor	Last Name: Bryant
Post: Lecturer	School/Department: SSIS/Psychology	
Email: E.J.Bryant@bradford.ac.uk	Telephone: 01274 235541	

A2.1. Is this a student research project?

If yes, please provide the student's contact details and course. Yes.

Lisa Pepper, MPhil leading to PhD, SSIS/Psychology

Email: lpepper@bradford.ac.uk

A2.2. Other key investigators/co-applicants (within/outside University), where applicable:
Please list all (add more rows if necessary)

Title	Full Name	Post	Responsibility in project	Organisation	Department

N/A	Dr Gill Waters	Lecturer	Supervisor	University of Bradford	SSIS/Psychology

A2.3 Name of body funding the project (if appropriate) and any other declarations of interest: (NOTE: *Only projects with the funding confirmed need approval)*

N/A

A3. Proposed Project Duration:

Start date: 9th June 2015 End date: 22nd July 2015

Complete this form if you are a member of staff or a student who plans to undertake a research project which will not involve the NHS but which will involve people participating in research either directly (e.g. interviews, questionnaires and/or clinical study not involving NHS patients) and/or indirectly (e.g. people permitting access to data and/or tissue). **Ultimate responsibility for gaining ethical approval lies with the Principal Investigator or Principal Supervisor of the project.**

Documents to enclose with this form, where appropriate:

This form should be accompanied, where appropriate, by an Information Sheet / Covering Letter / Written Script which informs the prospective participants about the proposed research, and by a Consent Form. Applicants should also attach any unvalidated Questionnaires, Interview Guides and the full research proposal.

Further guidance on how to complete this application form is available in the document **Guidelines for Completing the Research Ethics Application form** and this can be found at :

http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/ResearchEthicsApprovalProcess/

It is essential that this form is completed with reference to the information in the application form guidance document. Please pay particular attention to completing the form in sufficient detail to allow reviewers to judge ethical issues raised by this study. The form is intended to expand to allow as much space as is needed.

For University staff and students working with NHS patients or staff, or working on NHS premises, research ethics applications should be made through an NHS Research Ethics Committee: NHS Research Ethics Committee (REC)

Once you have completed this research ethics application form in full, and other documents where appropriate, check that your name, the title of your research project and the date appears on the first page and email it to the Research Support Unit Ethics Administrator. Please keep a copy and note that the original signed and dated version of 'Part B' of the application form should also be provided to the Research Support Unit Ethics Administrator in hard copy.

Attachments. Please confirm that you have included the following documentation with your submission:

Information Sheet	YES
Consent Form	YES
Research Proposal	YES
Unvalidated Questionnaires	YES
Interview Guidelines	N/A

Part A

A4. Mark 'X' in one or more of the following boxes if your research:

X	involves children or young people aged under 18 years

□ involves using samples of human biological material collected before for another purpose*

*Please contact the University's HTA Licence Holder, Prof Diana Anderson, [d.anderson1@bradford.ac.uk or ext. 3569] for advice.

http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Human Tissue Act

A5. Briefly summarise the project's aims, objectives and methodology

(this must be in language comprehensible to a lay person)

Aims and Objectives: This research is proposed to follow on from three earlier studies of my PhD thesis where the role of muscularity, adiposity (body fat) and other contributory factors are investigated in relation to body dissatisfaction in children.

Following the findings of the above studies (see research proposal for more detail) this research proposes to examine some of the factors influencing boys' desire to have a hyper-muscular or muscular physique which may indicate why these figures were chosen as body ideals and why the hyper-muscular figure was assigned positive attributes/adjectives by boys (For example boys used adjectives such as 'kind', 'hardworking' for these figures). This research will focus on boys only because there is a lack of research with pre-adolescent boys and the effects of exposure to muscular idealised images on body image (Humphreys & Paxton, 2004; Mulgrew et al, 2014).

Socio-cultural ideals of body shape and size portray the 'ideal' man as lean, with a muscular V-shaped body type and six-pack abdominal muscles (Tiggeman, 2011). Messages around these ideals are transmitted to children and this awareness may lead to a preference for particular body shapes and sizes developing at a young age and a desire to meet the ideal. Concerns about weight and muscularity appear to be two different pathways towards body dissatisfaction for adolescent boys (Jones & Crawford, 2005) and this could be the case for preadolescent children. Some boys desire a thinner figure, but usually less so than girls (Collins, 1991; Gardner et al, 1999; Ricciardelli et al, 2006; Schur et al, 2000; Smolak, 2002). A number of boys also want to increase their muscularity (Ricciardelli et al, 2006), shown by boys as young as four (McCabe et al, 2007). Furthermore a small number of girls and boys desire a larger figure (Collins, 1991; Markovic et al., 1998; Schur et al., 2000; Truby and Paxton, 2002).

Cultural expectations of body shape and size may contribute to body dissatisfaction. The sociocultural theory helps explain how the wider sociocultural environment, that is the practices, beliefs and norms of a society transmit messages about ideals around beauty and appearance (Tiggemann, 2011; 2012). These messages are internalized by the individual and may contribute to body dissatisfaction if they feel they do not fit the ideal (Tiggemann, 2011; 2012). Body ideals are communicated subtly and/or explicitly through the mass media (e.g. TV, films), family and peers, but exactly how the messages are transmitted to children is unclear. It is likely that a combination of factors and individual differences may influence the development of a child's body image dissatisfaction. However, sociocultural influences are not well researched with preadolescent children and where they are studied, results are contradictory with some indicating that boys' body image is not affected by these influences at all (Ricciardelli et al 2000).

The current research will investigate the influence of the media in the form of TV, films, books, comics, action figures and dressing up costumes, with a focus on superheroes because these media are directly or indirectly marketed at children. It is estimated that the average child spends 35-55 hours interacting with the media each week, including TV, the internet, advertisements, magazines and so on (Harringer, 2012). Media transmit messages around beauty ideals, such as using muscular men in advertisement for aftershave or promoting dieting products, and children may internalize these at a young age. Children internalizing these messages may begin to engage in unhealthy weight-related behaviours in order to conform to the ideal.

However, it is unlikely that media alone affects body image and it may be a combination of socio-cultural factors that has an effect. For example, friends, siblings, parents *and* the media all had an influence on body image for more than a third of adolescent boys in one study (Ricciardelli et al, 2000). The boys felt the media encouraged exercise to change body shape, but that fathers and male friends reinforced this message. The family are known to be an important influence on a child's body image, because they transmit societal messages about appearance ideals. Within the socio-cultural framework, the child's family can influence body image via two main mechanisms, modelling theory and active influences (Rogers, 2012) (see proposal for more detail). The messages parents give whether directly or indirectly, positive or negative seem to have an effect on children's body image, but the conflicting findings and limited research with younger children means further research is needed in this area.

There is much research around the benefits of involvement in exercise. For adults a review of the literature showed those exercising had improved psychological functioning and body image (Berger & Motl, 2000; Kirkcaldy and Shephard, 1990; Reed & Ones, 2006). This was also true for adolescents where exercisers experienced enhanced self-image and improved physical and psychological well-being (Kirkcaldy, Shephard and Siefen, 2002). However, what seems understudied is the impact parental involvement in exercise has on their child's body image. If modelling theory posits that family members' model body image for children through their attitudes and behaviours, this could be true of their modelling of

or attitudes towards exercise and may influence their choice of ideal figure towards a hyper muscular or athletic muscular figure.

The current research will focus on boys aged 4-7 and 8-11 and their parents and aims to find out:

- Which of the factors measured predict children's body satisfaction
  (Factors: child's age group, parental body satisfaction, parental BMI, parental satisfaction with child's body, parental choice of ideal adult figure for their child, parental encouragement for the child to control weight/develop muscles/engage in more physical activity, child's body composition, child's exposure to toys and media, householders engagement in exercise, child's awareness of householders engagement in and reasons for exercise, child choice of ideal adult figure)

- Which of the factors measured (as listed above) predict the boy's desire for a muscular figure
- If body (dis)satisfaction differs over three body parts (torso, arms, legs) and whether this varies between the two age groups
- If the child's body composition measures are associated with parental perception of body size of the child
- If the child's perception of their body size are associated with their body composition measures
- If parental BMI is associated with parental body satisfaction
-

Methodology: This study will be in 2 parts. Part 1 involves parents who will complete a questionnaire. Part 2 involves the male children of the parents who complete the questionnaire who will take part in a task in school.

Participants: Parents of boys aged between 4 and 11 years old will complete a questionnaire. The male children of the parents recruited from the reception school year up to year 6 will take part in a task. We aim to recruit 30-40 children within each age category (30-40 x 4-7year olds and 30-40 x 8-11year olds). A maximum of 2 children from each parent who is completing the questionnaire will be included.

If an insufficient number of parents complete the questionnaire then equal numbers will be recruited from other school(s) that have been contacted and have agreed to take part in this research.

Part 1: Design for parents: cross-sectional questionnaire. Materials for parents:

Questionnaire. The questionnaire is divided into five short sections and should take no longer than 30 minutes to complete. Part 1 asks questions about their child. Part 2 is about the toys they played with and other media. Part 3 is about the adult completing the questionnaire. Part 4 is about physical exercise carried out by anyone in their household. Part 5 asks for demographic data. Please see proposal for details about each section. On page 2 of the questionnaire parents are asked to sign a consent form to consent to their

own participation in the study and to give consent for their child or two children to take part in a short activity at school with the researcher.

Procedure. The school has given permission for their pupils to be involved in this study. A letter to parents is sent home and the same information will be put into the school newsletter that is emailed to parents. Parents with at least one boy at the school will be asked if they would like to complete the questionnaire. They can access this via the link in the newsletter or can pick up a paper copy of the questionnaire from the school office. If they complete a paper copy they will be asked to seal it in an envelope and return it to the office for the researcher to collect later. Parents will consent to take part in the study by completing the consent form which is on page 2 of the questionnaire. In the consent form parents will also be asked to give their consent for one or two of their children to take part in the research (the task in school). They will add their child's/children's name to the form. They are asked to read the information, make a YES response if they have understood it and give consent by ticking the relevant boxes. They also give consent in the consent form for their data and their child's/children's data to be used. In part 1 of the questionnaire parents are also asked to give their child's name, date of birth and class. Please note information about the child is only used for purposes of locating the correct child for the task. The name, date of birth and class will be removed from the data to protect anonymity once the child has taken part in the task in school.

One parent may complete a questionnaire for up to 2 (male) children at the school. If two parents wish to take part they may do so if they have more than one (male) child at the school and complete a separate questionnaire for up to 2 different children each. Most questions just require a tick and the questionnaire should take no longer than 30 minutes to complete.

Part 2: Face-to-face task with children
Brief description of study
The task itself will involve taking the children individually to the quiet area or part of the classroom where they will be asked to take off their shoes and socks, step onto the scales and have their body composition recorded. The children will be asked to complete a simple jigsaw choosing a body (torso), legs and arms from a range of different shaped and sized body parts. They will be asked to choose body parts to represent what they think they look like now, and how they would like to look now. They will also choose what they would like to look like when they are older from a series of pictures. The whole task will last no longer than 15 minutes.

Study Design: The study is a cross-sectional design and will use a 2(body choice: actual x ideal body) by 3(body part: Torso x pair of arms x pair of legs) by 2(age: 4-7 years x 8-11 years) mixed design with repeated measures on the body choice and body part factors.

Materials for children: A body parts jigsaw with three different body areas/parts will be developed following the design of an earlier version used previously by the author, for a face-to-face study. The jigsaw comprises of seven torsos, seven pairs of legs, seven pairs

of arms varying in muscularity from no muscles to hyper-muscular or varying in body fat (adiposity) from very underweight to obese. The same jigsaw pieces will be used for the children to construct their actual and ideal body size and shape.

The use of three body parts allows children to express (dis)satisfaction with individual body parts and to combine muscularity and adiposity if they wish, for example they could select muscular arms, but not muscular legs. A voice recorder will unobtrusively record children's verbal responses. A record sheet will allow the researcher to record/score children's choices and children's verbal responses.

An adult scale showing 7 figures of an adult varying in muscularity and adiposity (the same as in part 1 of the questionnaire) is presented to the children. They are asked to select an image of how they would like to look when they are an adult. A complete image (not jigsaw) for future adult self is used because it would be difficult for children to visualise individual parts of their older self.

Procedure: The school has given permission for their pupils to be involved in this study. Parents will consent to take part in the study and also consent for their child or up to two children to take part in the research study in school by completing the consent form on page 2 of the questionnaire. They will also give consent in the consent form for their data and their child's/children's data to be used.

Children will give their assent to take part on the day of the research. Individual children (with the above consent) will be collected from the classroom and taken to the research area. Their gender, ethnicity and date of birth will be recorded on the sheet. (Date of birth is used to record chronological age only and will then be removed). Children will take their shoes and socks off and will stand on the body composition scales. A measurement of their body composition (including their body fat, muscle mass) will be taken and recorded. Children will not be told the reading due to the complex nature of the results. Parents can request to have their child's BMI category reported to them and are asked in part 1 of the questionnaire to give their email address if they wish to have this information.

Children will take part in three conditions, the perceived 'actual' and perceived 'ideal' body size and shape and perceived 'ideal' adult body size and shape. For condition one and two, children will be seated at a table and shown the demonstration jigsaw which comprises of a puppet torso, pair of puppet arms and pair of puppet legs. The researcher will demonstrate how the torso is placed on the table with the pair of arms and legs fitted to it. A blank head will be added and the child will be asked to draw a face on it.

Children will be presented with a range of jigsaw pieces comprising of torsos, arms and legs arranged into three groups (by body part) but randomly arranged by size and shape within these groups. They will be encouraged to look at and pick up the pieces to familiarise themselves with them. Care will be taken to ensure children understand the

task through careful questioning and modelling as required. Tasks will be counter-balanced to reduce order effects.

Condition 1: Perceived actual body size and shape:
The researcher will ask the child, 'Can you build a jigsaw of what you think you look like now?' Children will be prompted to choose a body (torso), pair of legs and arms.

As they are making their selection they will be asked:

'Why did you choose that body/pair of arms, legs for your body?'

'What do you like about them?'

Children' responses will be recorded and be checked later with the audio recordings taken. Children are asked to draw a face on the blank head shaped piece of paper to add to their body.

Each body part will be scored to allow for calculation of preference of choice of muscularity or adiposity (1-7). The separate scoring allows the researcher to identify whether the desire for muscularity or adiposity varies with different parts of the body.

The body parts will be retrieved by the researcher and placed back into their groups and then all pieces shuffled around within each group (so the child cannot easily pick out the piece selected previously).

Condition 2: Perceived ideal body size and shape: The researcher asks the child, 'Now can you build a jigsaw of what you would like to look like now?' You can use the same pieces again or different ones, it's up to you. The procedure is repeated as in condition 1.

For the child's perceived actual body size the three body part scores (torso, arms, legs) will be taken separately and compared with the perceived ideal body size. The difference between the actual and ideal pairs of numbers will give a 'discrepancy index' taken to be a measure of body satisfaction/dissatisfaction (Gardner, Friedman and Jackson, 1998). Scoring the dissatisfaction separately on each body part has the advantage that satisfaction/dissatisfaction with individual body parts will be revealed and not hidden within a combined score. The satisfaction/dissatisfaction score calculated would range from 0 (satisfied) to 6 (very dissatisfied) for each body part.

Condition 3: Perceived ideal adult body size and shape: The adult scale showing 7 figures of an adult varying in muscularity and adiposity is presented to the children. The figures are numbered 1-7 on the reverse. Children are asked to look at the images in order to familiarise themselves with them.

The researcher asks the child, 'Can you point to the figure that shows how you would like to look when you are an adult at 20 years old?

The number of the figure is recorded.

Younger children are thanked for their participation in the study, given a sticker and taken back to the classroom. Older children are debriefed about the study, thanked for their participation, offered a sticker and taken back to the classroom.

Statistical analysis. The researcher will enter the raw data into IBM SPSS Statistics package:

Aim 1: Questionnaire data will be analysed with a multiple regression to find out which of the factors measured predict children's body satisfaction. The factors/predictors are: child's age group, parental body satisfaction, parental BMI, parental satisfaction with child's body, parental choice of ideal adult figure for their child, parental encouragement for the child to control weight/develop muscles/engage in more physical activity, child's body composition, child's exposure to toys and media, householders engagement in exercise, child's awareness of householders engagement in and reasons for exercise, child choice of ideal adult figure)

Aim 2: A multiple regression will be used to find out which of the factors measured (as above) predict the boy's desire for a muscular figure.

Aim 3: To find out if body (dis)satisfaction differs over three body parts (torso, arms, legs) and whether this varies between the two age groups the data will be analysed with a 2(body choice: actual x ideal body) by 3(body part: Torso x pair of arms x pair of legs) by 2(age: 4-7 years x 8-11 years) mixed design ANOVA with repeated measures on the body choice and body part factors. Further post hoc analyses will be carried out if necessary.

Aims 4, 5, 6: Questionnaire data will be analysed with a multiple regression to find out which of the factors measured predict whether the child's body composition measures are associated with parental perception of body size of the child and the child's perception of their body size. If parental BMI is associated with parental body satisfaction

A6. Is there any potential for physical and/or psychological harm / distress to participants?

No potential for physical harm with adults or children.

Adults: It is not anticipated that adults will feel distress when answering the questions on the questionnaire. However, they are informed in the information at the start of the questionnaire that they do not have to answer any question they do not wish to.

Children: Addressing psychological harm: Children may feel distressed because:

1) They do not know the researcher. To minimise this, the researcher will be introduced to the class before the research and will work within the children's

everyday classroom environment, so their surroundings are familiar and they will have known people nearby.

2) They do not understand the task. The task is designed to require minimal instructions, is visual and situated in a context familiar to them and so these measures will aid understanding. Children will not be pressured into doing the task and can stop if it is difficult. If the researcher feels the child does not understand, they will stop the task and tell them they have finished.

3) Some children worry about getting it 'wrong', usually aiming to please. They will be encouraged to do their best, reassured there are no right or wrong answers, will be praised and encouraged throughout with 'well done', 'that's great', nods and smiles. When finished/ or the task is stopped they will be told they have 'tried very hard' and given a sticker 'for taking part' regardless of their performance (stickers are the standard accepted reward system used in primary schools). The researcher carrying out the study has a Disclosure and Barring Service certificate.

4) There is concern that by asking a child to think about their size/shape and their 'ideal' shape it is introducing ideas they may not have thought of. However, the tasks are age appropriate and in the context of a story and there is a Government body confidence pack aimed at 6-11 year olds where parents are encouraged to talk to their children about body image and how the 'ideal' body has changed over time, with discussions around how the media alter images to fit this ideal.

A7. Does your research raise any issues of personal safety for you or other researchers involved in the project and, if yes, explain how these issues will be managed? [especially if taking place outside working hours, off University premises or outside the UK]

No. The questionnaire for parents is available online or a paper copy can be collected from and returned to the office. The researcher will not meet parents unless requested to, in which case a meeting would take place in the school.

The second part of the study will take place in a school with the permission of the head teacher. The school has a strict visitor policy where access is only allowed to authorised persons and visitors sign in and out of the building.

The researcher will be working within school hours 9-3:30 approximately, with the supervisor's knowledge of the dates, times and location of the research. For issues of personal privacy, parents will be given the researcher's University of Bradford email address and telephone number, not a personal email address or phone number. The school will be given the researcher's University of Bradford email address and mobile telephone number.

A8.1 How will the potential participants in the project be (i) identified, (ii) approached and (iii) recruited?

Forty infant schools in the Bradford and Leeds area have volunteered to participate in research with the supervisor and the University of Bradford. This followed a recruitment letter that was sent out to all LEA infant schools in the Bradford and Leeds area at the beginning of 2010. Each school that volunteered has filled in a questionnaire that states the number of children in each year/stage and the possible suitable times of year for their future participation in research study. The participants for the proposed study are recruited from these 40 schools. Last year, three schools were contacted and asked if they would be willing to allow a study to be run in their school during March-July 2015. A meeting was conducted to discuss further details with two of the schools that responded. The most suitable school in terms of availability and pupil numbers have been chosen for the study with another school available if needed. At least one week before the study is due to start they will be issued with information sheets. Children will only participate in the study if their parents have given permission for them to take part through the questionnaire for parents. Children will take part in the research if they themselves are willing to take part on the day of the research.

Children with the following exclusion criteria will not participate in the study:
The researcher is not making a diagnosis or asking parents/schools to do so, but if a parent feels their child is overly concerned with the size or shape of their body (for example, they may regularly make negative comments about their appearance or weight) or may be under or over eating, they are asked to consider whether they should withdraw their consent for the child to take part in the study. It is felt that measuring a child's body composition could be distressing for the child if they already have concerns about their body. Parents may email the researcher to ask for more details of the research or for their opinion about participation. If teachers/the school hold similar concerns for particular children they are asked to consider whether the child should take part.

- Children who have been identified as having a diagnosed eating disorder, weight issue and/or body issue by a nurse or doctor will not be able to take part in this study.
- Parents will be asked not to consent for their child to take part in the study.
- Children who will not be able to understand instructions read aloud in English or have poor spoken English where support is not available for them to take part in the study.
-

A8.2 Please give rationale for sample size (as appropriate):

The study will require at least 60 children. Using GPower software it is calculated that a sample size of 30-40 boys for each of the two age categories 4-7 years old and 8-11 years old will be sufficient for 11 predictor variables (gives a power of 0.95). A maximum of 2 children per parent will be included to take part in the questionnaire.

A9. Will informed consent be obtained from the participants? Yes.

If informed consent or consent is not to be obtained please explain why:

Further guidance is at: http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Consent

A9.1. *This question is only applicable if you are planning to obtain informed consent:*

How do you plan to obtain informed consent? (i.e. the proposed process?):

The schools have already been contacted and given information about the study and a meeting between the Deputy Head teacher and researcher is taking place. The Head teacher and Deputy have given permission for the study to take place in their school. A further information sheet will be sent to the school detailing the study.

Parents give consent to take part in the study by reading the information about the study and agreeing to complete the questionnaire.

They give consent for one or more of their male child/children to take part in the study through section 1of the questionnaire. They give their child's name, date of birth and class, but this information will be removed as soon as the child(ren) complete the task in class. It is only used for purposes of locating the correct child in school.

Assent/ the child's agreement will be gained on the day of the research for those children with parental consent. They will be read a script and asked if they would like to take part (see below).

A9.2 *This question is only applicable if you are planning to obtain informed consent:*

What arrangements are in place to ensure participants receive on going relevant information about the study and the opportunity to withdraw consent if required?

On-going information about the study will be given out in an information letter as appropriate. Parents may contact me via email if they seek further information at any point. However, individual data from their child will not be reported.

If parents consent or take part in the study then change their mind and wish to withdraw their data, their child, or child's data they can do so by emailing the lead researcher and quoting the unique participation number from the questionnaire at any time without giving a reason.

Consent/assent from the children will be gained to ensure that they are willing to take part and the researcher will demonstrate the task to the child. Due to their age they will not be able to understand the intent of the study; however, they will be given the choice whether they want to take part in the study and will be allowed to stop participating at any time.

A9.3 *This question is only applicable if you are planning to obtain informed consent:*

How long will the participants have to decide whether to take part in the study? (If less than 24 hours, please justify)

The information sheet will be distributed to parents at least a week before the study is due to begin.

A9.4 *This question is only applicable if you are planning to obtain informed consent:*
Will participants be sought from one of the following groups?

- Children under 18 - YES
- People with learning disabilities
- People with a terminal illness
- People with mental health problems
- People with dementia
- Asylum seekers
- Those with a particularly dependent relationship with the researcher
- Other potentially vulnerable groups (please specify)

If yes, please state what special arrangements have been made to deal with the issues of consent for the participants above?

Please also see information stated above.

Some of my participants are children under 18. Parents or guardians will be given a full explanation of the study in an information letter and only parents who wish to complete the questionnaire and give consent for their child/children to take part in the study will fill out the questionnaire and consent form. Parents may choose one or two of their male children to participate in the study.

Children will have the research and task verbally explained to them in age appropriate language. 'Assent' will be gained from the children verbally (or by nodding) on the day of the research.

The researcher will be aware that a child may not want to participate on the day and could express this verbally, through their behaviour and/or they may become upset. The child's refusal to participate is respected and taken as a removal of their assent and they will not be asked to continue with the study. Any data collected so far will be destroyed.

The researcher is also aware of the power relations between children and adults where children are expected to participate in activities in the class. Children will be reminded that I am not a teacher and that they do not have to take part in the research if they do not wish to and that they will not get into trouble for refusing to by me, their teacher, head teacher or parents.

A10. What special arrangements have been made for participants for whom English is not a first language? (If no arrangements, please explain why)

For parents identified by the school as needing support for reading letters that come home from school, I will access resources within the Primary school and University where possible to write the information letter and opt out form in parents' home language/ or interpret the letter verbally for parents that may not be able to read in their home language. I will offer to conduct a meeting for all parents who need extra support understanding the research study and giving consent which may also include English speaking parents who need support with their literacy skills (reading and signing the opt out form if they wish to).

Due to the age of the children being tested instructions for participants must be spoken. For the children participating in the research I will access support within school (where possible) to aid the understanding of the instructions given. This may include using bilingual teaching assistants/learning mentors who can explain the task in the child's home language. Where support is not available, the teachers will be asked to identify any children that will not be able to understand instructions read aloud in English or have poor spoken English and these children will be excluded from the study.

A11. What steps have been taken to ensure participants have not been involved in similar study (in order to prevent over exposure) where this may be an issue?

Previous participation in any research study is unlikely due to the age of the children. In addition the supervisor is the first researcher at the University of Bradford to run psychological study such as these in local schools so it is unlikely that similar research has ever taken place. However, as a precaution schools will be asked whether the school has been involved in previous research studies of a similar nature. Schools/pupils who have participated in similar research will not be asked to take part in this research.

A12. Could this project potentially disadvantage any group of persons not included in the research?

- Children who have been excluded from the study or those whose parents have removed consent will be taken from the class to the research area and given the opportunity to play with the materials if they wish and will be given a sticker to minimise feelings of being "left out". Children who have been identified as having a diagnosed eating disorder, weight issue and/or body issue by a nurse or doctor will be given the opportunity to play with the puppet jigsaw (which does not have body parts) and given a sticker.

The researcher acknowledges that there could be a psychological and detrimental effect on children, for being included or excluded, in the form of bullying from the larger cohort of children. Steps have been taken to minimise this: Children are told that the researcher only needs a small number of boys from each class. If they do not have the chance to be picked they can still come and have a look at/play with the materials used and will receive a sticker. Children are not told that they have been excluded from the study. Within a school environment children are used to being included or excluded from different

interventions and activities that take place in the classroom where teachers target certain cohorts of children, and so this is not different to the usual daily experience of the children.

A13. What measures will be put in place to ensure confidentiality and/or anonymity of personal data, where appropriate?

Questionnaire answers will be treated in the strictest confidence and will only be used for the purposes of this research. Parents are not asked their names and are given a unique participation number on the top of the questionnaire. If they wish to withdraw their data they quote the participation number from the questionnaire. Parents give consent for one or more of their male through section 1of the questionnaire where they give their child's name, date of birth and class. This information will be treated in the strictest confidence and this information will be removed as soon as the child(ren) complete the task in class. It is only used for purposes of locating the correct child in school. It will be recorded separately from any data and destroyed after the study.

While the researcher will use the names of the children during the running of the study only the children's gender, age in months, height, weight and body composition will be recorded on paper. Any class lists used will remain in school (locked in the office) at the end of each day. The children will be given a unique number that will enable their written and audio results and body composition to be identified. This information and the resulting data from the study will be stored for a maximum of ten years by the researcher and may be published. Parents, teachers and schools will be informed of this.

A14. Will financial / in kind payments (other than reasonable expenses and compensation for time) be offered to participants? (Indicate how much and on what basis this has been decided) No.

A15. Will the research involve the production of recorded media such as audio and/or video recordings? Yes.

A15.1. *This question is only applicable if you are planning to produce recorded media:*

How will you ensure that there is a clear agreement with participants as to how these recorded media may be stored, used and (if appropriate) destroyed?

Parents and teachers will be informed of the purpose of the audio recordings. The children's verbal responses in the study will be recorded as a secondary source of data to find out why children have or have not chosen particular picture cards. The audio recordings will be destroyed in the month following testing.

A16. Which institution has agreed to act as **research sponsor** for the project? (If you are conducting the research as either a student of the University of Bradford or as

a researcher working on a University of Bradford research project, the University of Bradford will normally act as research sponsor. If you are conducting the research as a student or employee of another university, that institution should normally sponsor the research.)
University of Bradford

A17. Please confirm that the research sponsor has **provision in place for indemnifying the researcher** for negligent or non-negligent harm to participants? (If you are conducting the research as either a student of the University of Bradford or as a researcher working on a University of Bradford research project, such indemnity is in place. If you are conducting the research as a student or employee of another university, that institution should normally provide indemnity.)
More information available at: *http://www.bradford.ac.uk/gateway/research/research-support-for-academics/ethics/GuidanceonEthicalIssues/ - click on Insurance for Research*

Part B – The Signed Declaration

Title of Research Project: Gender stereotypes around body shapes that incorporate muscularity and adiposity.

I confirm my responsibility to deliver the research project in accordance with the University of Bradford's policies and procedures, which include the University's:

- '**Research Governance & Quality Assurance Code of Good Research Practice**' and the
- '**Code of Practice for Ethics in Research'** (Ethics Policy)

http://www.bradford.ac.uk/gateway/research/research-support-for academics/ethics/EthicsPolicyandStrategy/

and, where externally funded, with the terms and conditions of the research funder.

In signing this research ethics application form I am also confirming that:

- The completed form is accurate to the best of my knowledge and belief.
- The project will comply with the University's Research Ethics Policy.
- I undertake to adhere to the content and process of the project as detailed in this (and attached) documents and to inform the Panel of any changes.
- I am aware of my responsibility to be up to date and comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data, including the need to register when necessary with the appropriate Data Protection Officer (currently the responsibility of Professor Geoff Layer) and the HTA Designated Individual (Professor Diana Anderson).

- I understand that the project, including research records and data, may be subject to inspection for audit purposes, if required in future and that these records will be stored for a period of 10 years from the end of the project.
- I understand that personal data about me as a researcher in this form will be held by those involved in the ethics review procedure (e.g. the Research Support Unit Ethics Administrator and/or Ethics Reviewers) and that this will be managed according to Data Protection Act principles.
- If this is an application for a 'generic' project all the individual projects that fit under the generic project are compatible with this application.

Name of the **Principal Investigator** (or the name of the **Principal Supervisor** if this is a student research project):

…..... Dr Eleanor Bryant

Signature of **Principal Investigator** (or the **Principal Supervisor**):

…… **……** Date: **……9/03/15……...**

Appendix 2

Example of an information letter sent to school

Date: 8th June 2015

Dear (Headteacher's name)

Thank you for meeting with me and agreeing for your school to take part in my PhD research study for the University of Bradford. As discussed previously my area of research is in the development of young children's body image. The following letter contains further information about the study, which I will be undertaking at your school between 15th June- 17th July 2015 if this is convenient for you and your school.

Introduction:

Research suggests that by the age of 6 to 9 years, some children have a preference for particular body size shapes and sizes. For example, girls as young as five seem to show preferences for very thin bodies. For boys the research is more mixed, with some boys preferring thinner figures, some wanting muscles and others wanting a 'bigger' figure. My research will focus on exploring possible influences in the choice of these figures for boys, in particular, the influences from parents and the media.

It is now understood that boys and men can have concerns about their bodies, but these concerns may be different to those girls and women have. There is not as much research about boys and body image as there is about girls and research is not often conducted with primary school aged children. It is therefore really important to find out how young boys feel about their bodies because it will help in understanding the early influences on boys' body image. This could assist in

developing appropriate interventions to address their body image concerns early on perhaps before more serious problems, such as eating disorders, occur.

My study:

This research study consists of a questionnaire for parents of boys in your school and a task for the child/children to do with me in school.

A letter to parents will be sent home (I will bring these into school) and information will be put into the newsletter that is emailed to parents. Parents with at least one boy at the school will be asked if they would like to complete the questionnaire. They can access this via the link in the newsletter or can pick up a paper copy of the questionnaire from the school office. I have attached a copy of the questionnaire to this letter. If parents complete a paper copy they will be asked to seal it in an envelope and return it to the office for me to collect later. In the questionnaire the parent will be asked to give consent for one or two of their boys to take part in the task at school.

Who can take part in the study?

A parent who has at least one boy at the school can take part.

Two parents can take part if they have more than one child at the school and each parent completes a separate questionnaire. Or one parent can complete the questionnaire for up to two children if they wish.

What the study involves:

The study has **2 parts:** The questionnaire for the parent(s) and task in school for the child/children

Part 1 asks parents to fill out a questionnaire with questions about themselves, their child, toys their child play/played with and other media (such as TV) and exercise carried out by anyone in their household. Most questions just require a tick and the questionnaire should take no longer than 30 minutes to complete.

There are some questions asking the parent's opinion of their child's body or body image that they may feel are personal in nature. Parents are told they do not have to answer any questions they do not wish to.

Part 2 Involves working with the child or children the parents who have completed the questionnaire have given consent for. This may include (male) children from reception class up to year 6. They will complete a task in school. I will arrange with you when is best to come in, but is anticipated to be between the 7th- 17th July 2015.

The task itself will involve taking the children individually to the quiet area or part of the classroom where they will be asked to take off their shoes and socks. I will then ask them to step onto the scales and record their body composition. Parents can request to have their child's BMI category reported to them through the questionnaire (these will be emailed to parents at the end of the study).

Next, I will demonstrate the task to the children. They will be asked to complete a simple jigsaw choosing a body (torso), legs and arms from a range of different shaped and sized body parts. The children will be asked to choose body parts to represent what they think they look like now, and how they would like to look now. As they complete the jigsaw, they will be asked about their choices and their comments will be recorded on paper and using a digital recorder. The voice recordings will be deleted within 48 hours of the task once the children's comments have been checked against those recorded on paper. They will also choose what they would like to look like when they are older from a series of pictures. The whole task will last no longer than 15 minutes and the children will receive lots of positive praise and a sticker for taking part, regardless of their performance.

This research has been granted ethical approval by the Chair of the Humanities, Social and Health Sciences Research Ethics Panel at the University of Bradford on 4th June 2015 and follows strict ethical guidelines laid out by the British Psychological Society. This means parents will give their consent to take part in the

study when they complete the questionnaire and will give consent for their child/children to take part in the task at school. Children must give their verbal agreement to take part in the task at school, but can opt out or stop the task at any time without giving a reason. Parents will be given an information letter and link to access the questionnaire online. A paper copy of the questionnaire will be available if preferred. The child's name will not be recorded and their responses will remain anonymous and confidential, as will data about body composition. Parents are able to withdraw their or their child's data up to 15th August 2015 by quoting their participation number from the questionnaire at which point the data will be analysed and written up.

About the researchers:

I am the primary investigator in this research and a PhD student at the University of Bradford. I hold a full Disclosure and Barring Service certificate (DBS - the new CRB check). My project is supervised by Dr Gill Waters who specialises in children's cognitive development and Dr Eleanor Bryant who specialises in body image research at the University of Bradford Please do not hesitate to contact me (researcher's email) or my supervisors (supervisor's emails) at any time if you require any further information about this research.

Many thanks for your involvement in this research.

I look forward to coming into school,

Yours faithfully

Lisa Pepper

Email: (researcher's email)

Appendix 3

Example of an information letter given to parents

Date: 12th June 2015

Dear Parent/Carer,

My name is Lisa Pepper and I am researching the development of young children's body image for my PhD at the University of Bradford. You have been given this letter because you have at least one boy at this school. You may have girls too, but this research is focusing on boys only. Research suggests some boys choose thinner, bigger or more muscular figures as an ideal body choice for themselves. I am interested in finding out where boys' ideas about ideal body shapes and sizes come from and how they influence the choice of an ideal body type. I have been given permission by your Head teacher to give you some information about my study. I would like to invite you and/or your partner to complete a questionnaire and give permission for your boy or boys to take part in the study.

Why it is important

It is now understood that boys and men can have concerns about their bodies, but these concerns may be different to those girls and women have. There is not as much research about boys and body image as there is about girls and research is not often conducted with primary school aged children. It is therefore really important to find out how young boys feel about their bodies because it will help in understanding the early influences on boys' body image. This could assist in developing appropriate interventions to address any body image concerns early on perhaps before more serious problems, such as eating disorders occur.

Who can take part in the study?

A parent who has at least one boy at the school can take part.

Two parents can take part if you have more than one child at the school and each parent completes a separate questionnaire. Or one parent can complete the questionnaire for up to two children if they wish.

What the study involves:

The study has **2 parts:** A questionnaire for parent(s) and a task in school for the child/children

Part 1 asks you to fill out a questionnaire with questions about yourself, your child, the toys they play/played with and other media (such as TV) and exercise carried out by anyone in your household. Most questions just require a tick/selection and the questionnaire should take no longer than 30 minutes to complete. There are some questions asking your opinion of your child's body or body image that you may feel are personal in nature. **Please do not answer any questions you do not wish to.**

The questionnaire can be accessed online (the link is given at the end of this letter) or a paper copy is available at the school office (please return it to the school office in a sealed envelope). It will be available until Tuesday 14th July. You are asked to give consent for at least one of your (male) children to take part in a task at school (details below).

Part 2 Involves working with the child or children you have given consent for. I will come into school between the 7th- 17th July 2015 and will work in your child's class or quiet shared area. Your child will be asked to put together a simple jigsaw choosing a body, legs and arms to show what they think they look like and want to look like. They will also choose what they would like to look like when they are older from a series of pictures. They will be asked about their choices and their comments will be recorded using a digital recorder, which will be deleted within 48 hours of the task. The task lasts around 10-15 minutes and your child will receive lots of praise and a sticker. I worked for 12 years as a primary school teacher and

have conducted research with children and find they usually enjoy taking part in tasks like this.

Your child's name will not be recorded at all and their answers will remain anonymous and confidential. Your child's body composition will be measured with body composition scales, where your child will be asked to take off their socks and step onto the scale. Again your child will not be identifiable from this information. This data is only used for the purposes of this research and is not reported to the school. You can be informed of your child's BMI category if you wish and can request this in the questionnaire. If you consent or take part in the study then change your mind and wish to withdraw your child, their data or your own data you may do so up to 15th August 2015 without giving a reason. Please email me and quote your participation number from your questionnaire.

If you do not wish to take part in this study or do not wish for your child/children to take part I would like to reassure you that there will be no consequences for your child for not taking part. To minimise feelings of being left out, all children will be told that only a small number of children are needed from the class and that all children can look at and play with the research materials, unless you prefer otherwise (please email me or let the class teacher know). Your child will receive a sticker regardless of whether or not they have taken part.

This research has been granted ethical approval by the Chair of the Humanities, Social and Health Sciences Research Ethics Panel at the University of Bradford on 4th June 2015. My project is supervised by Dr Gill Waters who specialises in children's cognitive development and Dr Eleanor Bryant who specialises in body image research at the University of Bradford. I hold a full disclosure and barring service certificate (the new CRB check). Please do not hesitate to contact me (researcher's email) or my supervisors (supervisor's emails) at any time if you require any further information about this research and your child's participation.

As children are becoming increasingly aware of body image in advertising and the media, your child may want to talk about it with you. If you would like to find out more information about children and body image please contact us and we will be glad to discuss the area in more detail with you. Alternatively there is a Body image parent pack aimed at parent's of 6-11 year olds that gives ideas for discussion. You can download it for free from: http://www.mediasmart.org.uk/parents/pack

You may already be concerned about your child's attitude to body image, weight and/or food. If you are and wonder whether your child should take part in this research, please do not hesitate to contact me at lpepper@bradford.ac.uk (Please note I aim to reply within 48 hours)

Thank you very much for considering my request. Please click on the link at the bottom of the page if you would like to complete the questionnaire. This research is important because it will help in understanding the early influences on body image in boys which is an understudied area. This study is part of wider research investigating the development of body image in 4-11 year old boys and girls. These results may form part of a collection of data that may be read by others or published later.

Yours sincerely

Lisa Pepper

E-mail: (researcher's email)

Please click on or copy and paste this link into your browser for the questionnaire (available from Friday 12th June):

https://bradford.onlinesurveys.ac.uk/factors-influencing-ideal-body-choice-2

Appendix 4

Script for children giving a brief outline of the study

The following statements/questions will be read out to Key stage 1 children:

"Hi my name is Lisa and I'm here to play a game with some of the children in this class. If you want to play the game I'll show you how to do it first then you can have a go. It's like a jigsaw and I'll ask you some questions whilst you are making it. We'd play the game over there (point to location in classroom where study will take place). You don't have to play the game with me if you don't want to. You won't get into any trouble. Just tell me if you don't want to, ok? Or if we start playing the game and you decide that you don't like it and you want to stop, that's fine too. So do you have any questions you want to ask me about it? Would you like to play the game with me for a little while?"

The following statements/questions will be read out to Key stage 2 children:

"Hi my name is Lisa and I'm here to do a research study with some of the children in this class. If you want to do the study I'll demonstrate the task first then you can have a go. I have different parts of the body that fit together like a jigsaw and I'll ask you some questions whilst you're putting it together. We'd do it over there (point to location in classroom where study will take place). You don't have to take part if you don't want to. You won't get into trouble. Just tell me if you don't want to, ok? Or if we start task and you decide that you want to stop, that's fine too. So do you have any questions you want to ask me about it? Would you like to take part in this research study?"

Appendix 5

Debrief for older children (approximately 10-11 years old)

Thank you for taking part in my research study. Other research has shown that some boys choose thinner, bigger or more muscly/muscular figures for how they would like to look and in this study I am trying to find out why boys may choose those figures.

I am interested in which figure you choose and whether it is the same as the way you think you look now or different. This could show me whether you are satisfied with the way you look or whether you want to look different.

I've asked your parents questions in a questionnaire about many different things such as exercise and whether you have played with muscly/muscular action figures, to try to find out where your ideas about the figure you have chosen could come from.

Do you have any questions or anything you would like to say?

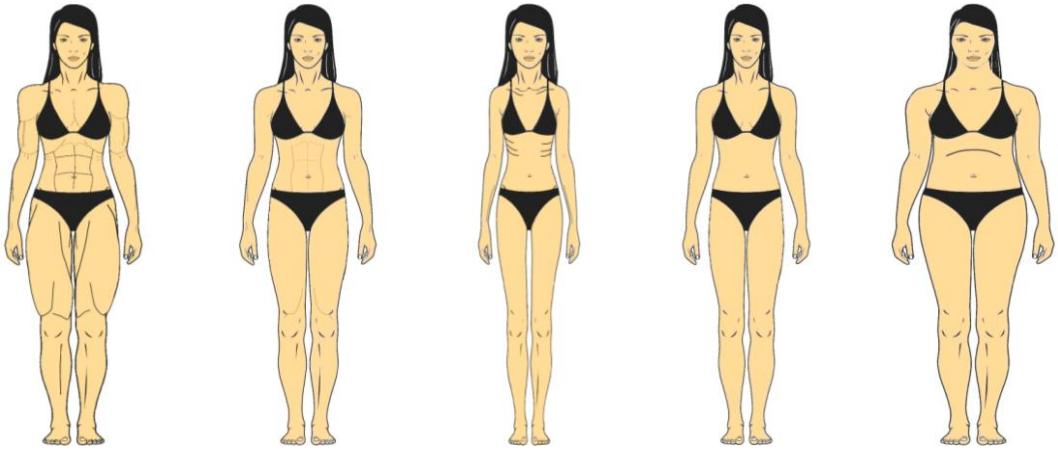
Would you like a sticker?

Thank you for taking part in this research. I'll take you back to your classroom now.

Appendix 6

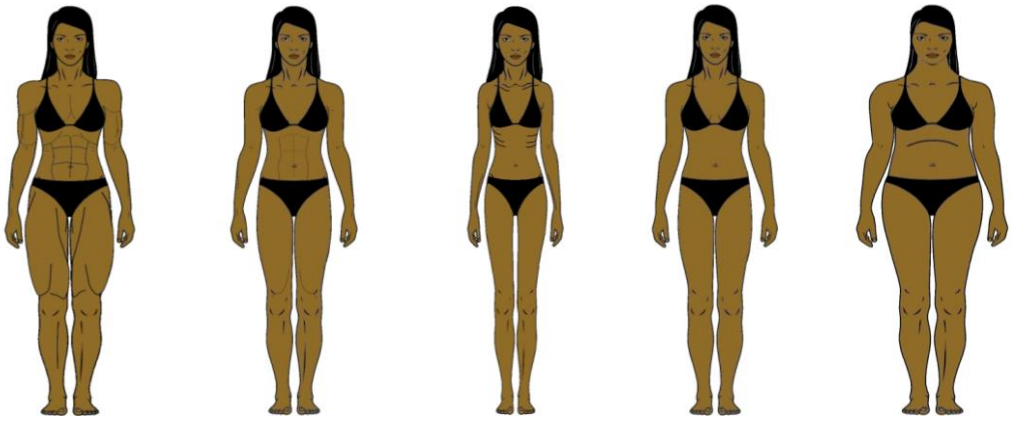
Figure scales constructed and used for studies 2 and 3

A6.1. Caucasian woman



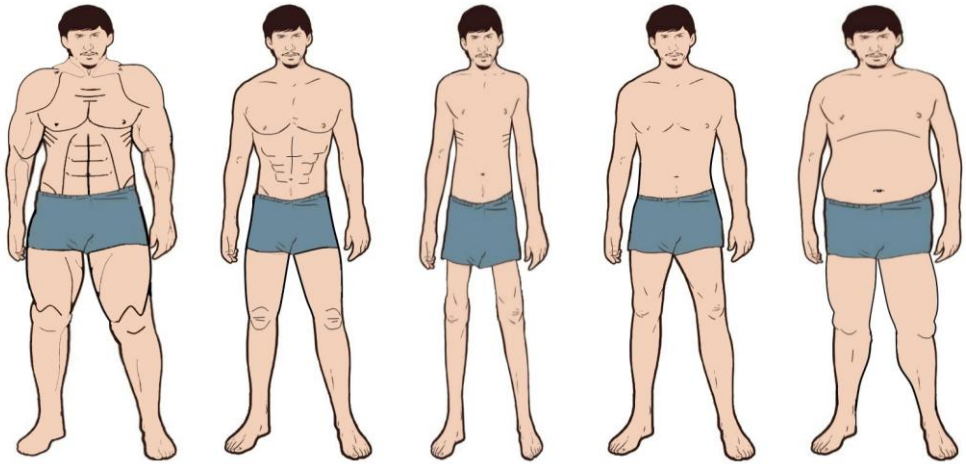
1 2 3 4 5

A6.2. Asian woman



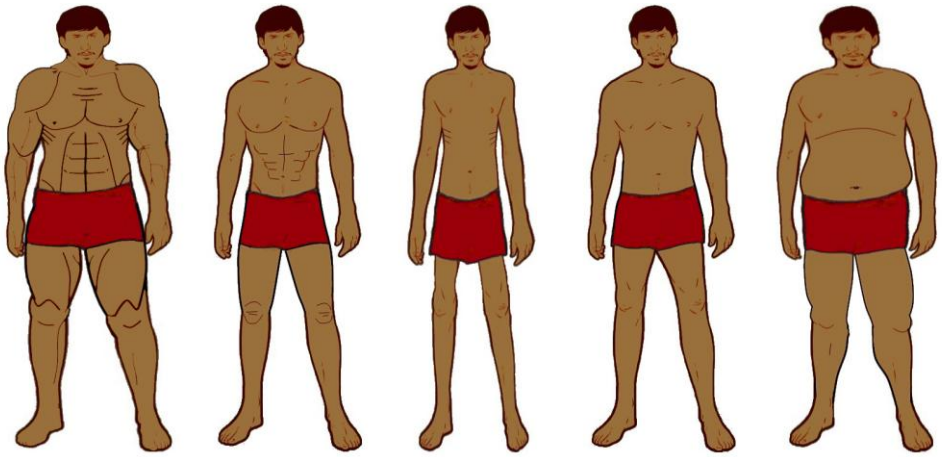
1 2 3 4 5

A6.3. Caucaisan man



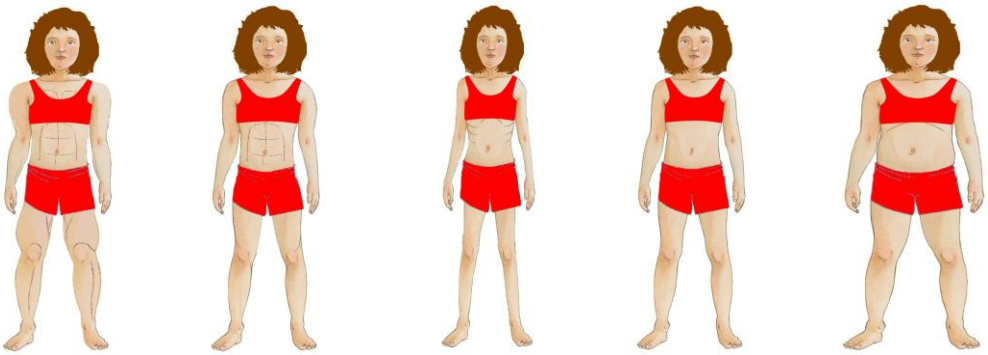
1 2 3 4 5

A6.4. Asian man



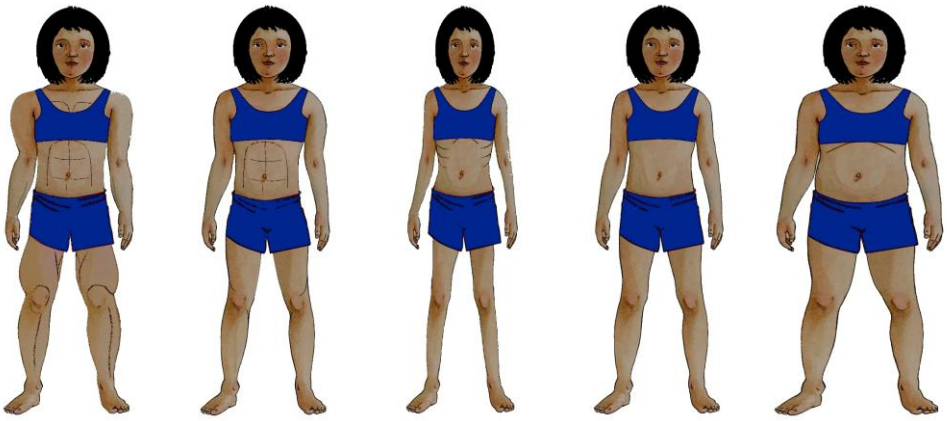
1 2 3 4 5

A6.5. Caucasian girl



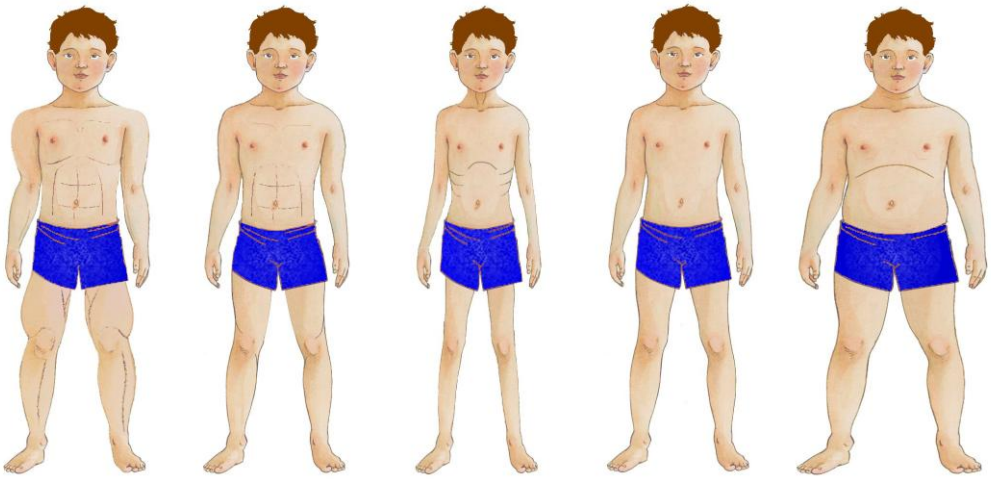
1 2 3 4 5

A6.6. Asian girl



1 2 3 4 5

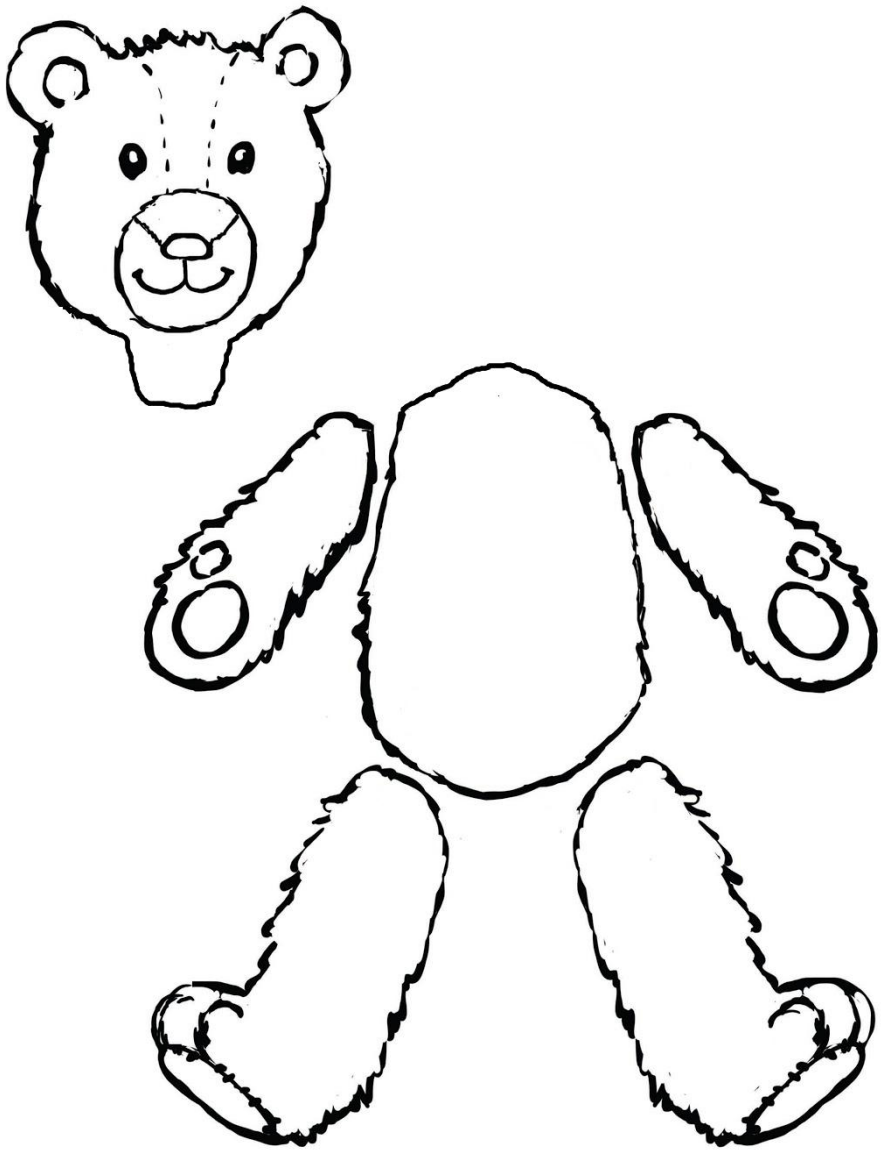
A6.7. Caucasian boy



1 2 3 4 5

Appendix 7

Puppet jigsaw for familiarisation task for studies 1 and 4



Appendix 8

An overview of the project information for the touch screen computerised application

UNIVERSITY OF BRADFORD
MAKING KNOWLEDGE WORK™

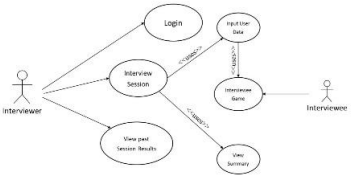
School of Electrical Engineering and Computer Science

Children's Body Image Assessment Tool

The aim of this project (coordinated in collaboration with the Division of Psychology) is to develop a prototype to facilitate the use of pre-configured body image assessment on mobile devices with children aged 3-11 years, and to collect and store online the captured information.

Java { } MySQL

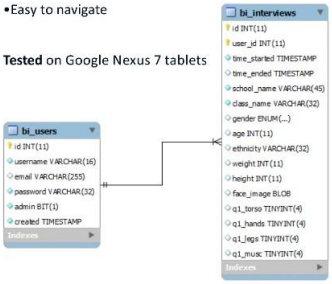
Programming and facial detection are done in Java. The information is stored in a MySQL database and the targeted platform is Android OS.



Design:

- Children-friendly interface
- Large and suggestive buttons
- Intuitive
- Easy to navigate

Tested on Google Nexus 7 tablets



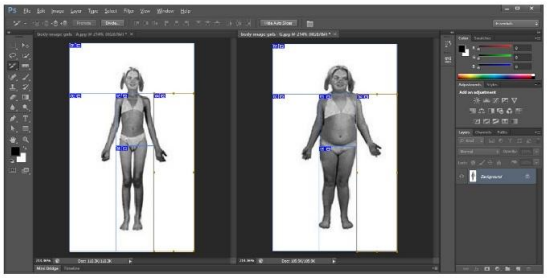
Objectives:

- Use of touch screen interactive interfaces;
- Development of a scale that can be manipulated at 3 levels: torso, arms and legs;
- Use of child's face on the on the scaling interface;
- Link to a measureable index of adiposity and muscularity

Information Gathering:

An interview session will consist in 3 main parts which determine the data collected:

1. Personal information (age, gender, school etc);
2. Picture of the interviewee;
3. Interviewee's perspective on his/her appearance.



Age considerations:

- Children under 7 have limited attention span;
- Complex tasks place unreasonable cognitive demands;
- Young children may struggle to verbalize;
- Children need lots of praise and encouragement.

Dan Alexandru Pod
10019704

BSc (Hons) Computer Systems Administration
Supervisors: Prof. Daniel Neagu (EECS)
Dr. Gill Waters (Division of Psychology)
Collaborator: Ms. Lisa Pepper, PhD student

Appendix 9

Bradford University article

Bradford student develops smartphone app to help with understanding of body image

Published: Mon 21 Jul 2014

A University of Bradford undergraduate student has been highly commended for the creation of a mobile app for a PhD student investigating young children's body image perception.

Lisa Pepper, a 2nd year Psychology PhD student is investigating young children's body image dissatisfaction as part of her PhD research. In particular, she is interested in developing more accurate ways of assessing young children's beliefs about muscularity.

Lisa came up with an idea for a mobile app that children could touch to manipulate images of different body shapes. Lisa's lecturers then worked with the School of Computing to set the task of creating this app to one of its students.

Dan Pod accepted the challenge and has produced a prototype of a mobile app according to Lisa's specifications. Lisa Pepper says, "The development of a body image assessment mobile app has been the focus of my PhD studies for the last 11 months, so the chance to draw on the expertise at the Department of Computing has been invaluable.

"Dan and our respective supervisors have shown great commitment to the project and it has been exciting to see the two disciplines working together. It has been very rewarding to see my idea come to fruition and with the continuing support of the Division of Psychology and the Department of Computing I'm looking forward to developing the project further".

Dan Pod says, "Working on this year's dissertation has been the most rewarding experience of my university studies. The University's hands on approach allowed me to build a system focusing on elements from both disciplines. I look forward to seeing my system deployed in a live environment and I am confident that the University's bright minds will carry on my research".

The project has been awarded The Best Computing Final Year Project Award this year, with the inputs and possible impacts being highly commended by the Board of Examiners.
The academics involved were Dr Gill Waters and Dr Ellie Bryant from Psychology and Prof Dan Neagu and Dr Yang Lan from Computing.

Appendix 10

6 pairs of attributes used in study 2

strong – weak

hardworking – lazy

tells the truth – tells lies

kind – mean

brave – coward

bossy – not bossy

Appendix 11

Questionnaire for parents used in study 4

Participation number: _____

Factors influencing ideal body choice

Investigators: Lisa Pepper (principle investigator), Gill Waters, Ellie Bryant

You are invited to take part in a research study for the University of Bradford. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take your time and read the following information carefully. Ask me (the principle investigator) if there is anything that is unclear or you would like more information about.

The purpose of this research is to investigate where ideas about body shapes and sizes come from and how they may influence a boy's choice of ideal body type. This research study is important because it will help in understanding the early influences on body image in boys which is an understudied area. This study is part of wider research investigating the development of body image in 4-11 year old boys and girls.

The questionnaire is divided into five short sections and should take you no longer than 30 minutes to complete. Part 1 is about your child's body image. Part 2 is about the toys they played with and other media. Part 3 is about your body image. Part 4 is about physical exercise carried out by anyone in your household. Part 5 asks for demographic data. There are some questions asking your opinion of your child's body or body image that you may feel are personal in nature. <u>Please do not answer any questions you do not wish to.</u>

In the consent form below you will be asked to give consent for your child or children to take part in a short activity at school with the researcher. In the form and in part 1 of the questionnaire you will be asked to give your child's name, date of birth and class, but this information will be removed as soon as your child completes the task. I welcome the involvement of as many parents and children to take part in this research who wish to. One parent may complete a questionnaire for up to 2 (male) children at the school. If two parents wish to take part you may do so if you have more than one (male) child at the school and complete a separate questionnaire for up to 2 different children each. Please note your child will also be asked if they would like to take part in the task in school and they do not have to take part on the day if they do not wish to. Your questionnaire answers may still be used in this instance unless you request otherwise.

Your answers will be treated in the strictest confidence and will only be used for the purposes of this research. You cannot be identified from this data. Please do not answer any question you prefer not to. If you consent to take part in the study then change your mind and wish to withdraw your child, their data or your own data you may do so without giving a reason up to 31st December 2015 at which point the combined data will be analyzed and written up. Please email me and quote your participation number from your questionnaire if you wish to withdraw. **If you have any questions or concerns regarding this research please contact: l.pepper@bradford.ac.uk** **Please go to next page**

Consent form for parents and children taking part in the study

Thank you for considering taking part in this research study. I would be grateful if you would read through the following questions and indicate your response to each of them. The reason for this is to ensure that you are fully aware of the purpose of the research and that you are willing to take part. You are also asked to give consent for your child/children to take part in the study.

Please take **child** to mean child, or children if you are consenting for two children

I have been informed about the purpose of the study and have had the opportunity to ask questions about it if I wish

YES/NO

I understand that I can withdraw my data and/or my child's data from the study by 31/12/15, without giving a reason and that this data will not be included in the research

YES/NO

I understand that I am free to choose not to answer a question without giving a reason

YES/NO

I understand my child is free not to take part in the task in school if they do not wish to participate on the day of the research

YES/NO

I understand that any information I or my child provides will be kept confidential and only the researchers listed above will have access to the information

YES/NO

I understand that my/my child's responses will form part of a collection of data that may be read by others or published later

YES/NO

I understand that no identifying information about myself or my child will be stored alongside my responses

YES/NO

I give my consent to take part in this research study (please tick) ☐

I give consent for my child, name_____ ☐

to take part in this research study

I give consent for my child, name _____ ☐

to take part in this research study

Factors influencing ideal body choice

As section 1 is asking for *your* opinions about your child's body or body image please can I ask that parents complete this section on their own without discussing this with their partner until after completion.

Part 1: About your child

If you would like another one of your male children who attends this primary school to take part in this study please fill out an extra child section found at the end of the questionnaire. Up to **2** male children per parent can be included in this study.

Child 1: Name _____ Class:____ Date of Birth: __/__/20__

Please give your email address if you would like your child's BMI category to be reported to you after the study_____

All name, date of birth and class data will be removed once your child takes part in the task in school

Child scale

A **B** **C** **D** **E** **F** **G**

Adult scale

Please tick **one** box to select the figure for your child in response to the questions below

	A	***B***	***C***	***D***	***E***	***F***	***G***
Use the child scale above: 1. Which picture looks the most like your child?							
2. Which picture shows the way you would like your child to look?							
Use the adult scale above: 3. Which picture shows the way you would like your child to look when they are an adult? (Aged 20)							

Please tick **one** box to indicate your answer:

In your opinion and taking their age into consideration, is your child:

4. Underweight	**The right weight for them**	**Overweight**

5. Not muscular enough	**The right amount of muscle for them**	**Too muscular**

Please rate the extent to which you agree with these comments.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
6. My child makes comments about wanting bigger muscles					
7. My child makes comments about wanting to be thinner					
8. I encourage my child to do more physical activity					
9. I encourage my child to control their weight by eating less or eating more healthily					
10. I encourage my child to increase their muscle size					

Please move on to part 2

Part 2: Toys and other media

11. Please tick all the toys your child has owned and played with in the past/now (you may tick more than one box)

											
Wrestler		The Hulk		Sportacus		Spiderman		Batman		Superman	

											
Power Rangers		Mr Incredible		Wreck it Ralph		Thor		Captain America			

Other(s): _____(please specify)

12. Please indicate the ages at which your child played with these figures (you may tick more than one box)

Under 2 years old		2-4 years old		5-7 years old		8-10 years old		11+ years old	

Think about the time when your child enjoyed the characters shown before. Please tick **one** box in response to the questions below

	Never/ Very rarely	Rarely	Sometimes	Often	Very often
13. How often does/did your child play with these figures?					
14. How often does/did your child watch TV programs/films portraying the characters alike to those shown above?					
15. How often does/did your child read books/comics/magazines portraying the characters alike to those shown above?					
16. How often does/did your child play computer games portraying the characters alike to those					

shown above?					

Dressing up costumes:

17. Please tick all of the types of dressing up costumes your child has owned and played with in the past/now (you may tick more than one box)

				
Superman ☐	Spider man ☐	Batman ☐	Captain America ☐	Wrestler ☐
				
Sportacus ☐	Thor ☐	The Hulk ☐	Mr Incredible ☐	Power Ranger ☐

Other(s): _____(please specify)

18. Please indicate the ages at which your child dressed up in these costumes (you may tick more than one box)

Under 2 years old		2-4 years old		5-7 years old		8-10 years old		11+ years old	

	Never/ Very rarely	Rarely	Sometimes	Often	Very often
19. How often does/did they dress up in these costumes?					

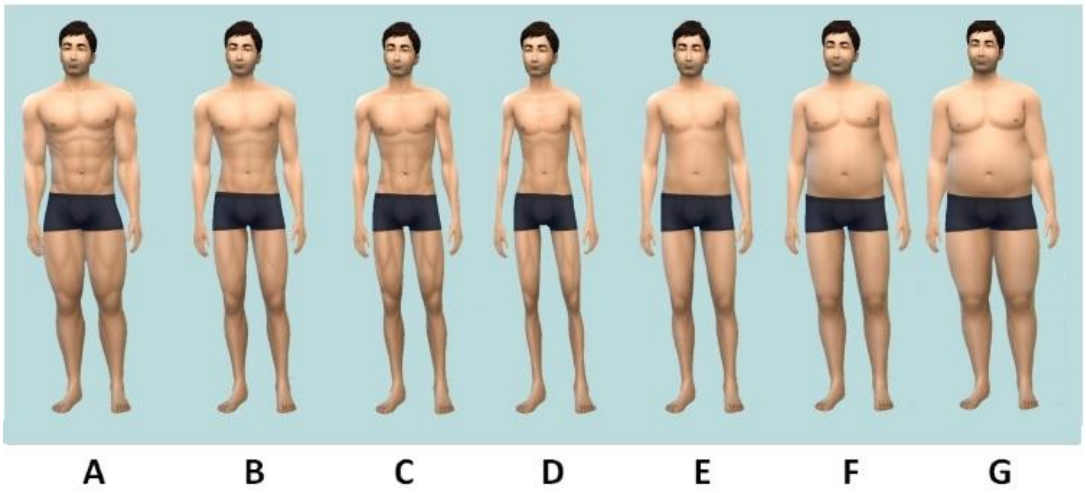
If you wish to complete this questionnaire for a second child, please find parts 1 & 2 repeated at the end of the questionnaire after part 5 (This can be completed later if you wish).

If you are not including another child in the study or prefer to add them later please move on to part 3.

Part 3: About you: (Please give the metric or imperial units below)

20. Height _____ Weight _____ BMI (if known) _____

The pictures below show male and female bodies, each varying in the amount of muscle and body fat they have.



Use the appropriate gender for you and tick one box to select the figure that is the best for you in response to the questions below

	A	***B***	***C***	***D***	***E***	***F***	***G***
21. Which picture looks the most like you?							
22. Which picture shows the way you would like to look?							

Please tick **one** box to indicate your answer:

23. Do you consider yourself to be:

Underweight	The right weight for me	Overweight

24. Do you consider yourself to be:

Not muscular enough	The right amount of muscle for me	Too muscular

Please move on to part Part 4:

About exercise carried out by people who live in your household

25. Who takes part in exercise inside or outside of your home? (By exercise I mean any extra activity carried out for at least 20 minutes as an addition to your normal daily activity. Do not include walking to work for example)

Please tick all that apply and give their gender

	Tick in this column	Gender
Partner		
Older male child (not at this school)		Male
Older female child (not at this school)		Female
Child 1 (mentioned in this questionnaire)		Male
Child 2 (if included in this questionnaire)		Male
Other relatives (please specify)		

26. Do you exercise? Please tick

Yes		If YES please complete the questions below about your exercise
No		If NO go to question 38

Your exercise:

	Once per month	2-4 times per month	2-4 times per week	5 or more times per week
27. How often do you exercise?				

28. What type(s) of exercise do you do? (e.g. “jogging”, “Yoga”, “circuit training”)

_____

_____

Please rate the extent to which you agree with these comments.

I exercise…	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
29. …to increase fitness					
30. …to build muscle					
31. …to lose body fat					
32. …to control weight					
33. …to improve performance for a particular activity/sport					
34. ...for other physical health benefits, such as lowering blood pressure					
35. …for psychological health benefits, such as improving mood					
36. …to socialize					
37. Other (please specify)					

38. What is your **main** reason for exercising? Please state ONE reason from above

---

39. Does anybody else in your household exercise other than the child (children) at primary school? Please tick

Yes		If YES please complete the questions below about their exercise
No		If NO go to part 5

Please choose one person to tell us about

40. Who is it? (E.g. Older son, partner)_____

41. Please give their gender _____

	Once per month	2-3 times per month	2-3 times per week	5 or more times per week
42. How often do they exercise?				

43. What type(s) of exercise do they do? (Please name, for example, circuit training)

_____

_____

44. What is their **main** reason for exercising? Please state ONE reason (for example, to lose weight or to increase fitness- you may choose from the list of reasons in questions 29-36)

Think about yourself and the people from your household who exercise and rate the responses

	Never/ very rarely	Rarely	Sometimes	Often	Very often
45. My child sees me/other family members exercising					
46. I/we talk about the exercise I/we do with my child					
47. My child knows my/our main reason for exercising					

Please move on to part 5

Part 5: Demographic information

Please tick one box for each of these questions

Gender	
M	
F	

Age	
15-19	
20-24	
25-29	
30-34	
35-39	
40-44	
45-49	
50-54	
55-59	
60-64	
65-69	
70-74	
75-79	
80+	

Ethnicity	
White	
Black	
Asian	
Mixed	
Other	

Employment status	
Self-employed	
Employed	
Unemployed – seeking work	
Unemployed – not seeking work	
Homemaker	
Student	
Military	
Retired	
Unable to work	
Other	

Marital status	
Single	
Married/Civil partnership	
Widowed	
Divorced/Separated	
Other	

Highest Qualification	
None	
O Levels, GSCE, or equivalent	
NVQ, Apprenticeship, etc.	
A level or equivalent	
College Diploma/Certificate	
Degree	
Masters, Doctorate or other professional qualification	

This is the end of the questionnaire. I appreciate the time you have given to complete it and thank you for participating in this study

Extra section: Complete this part to include one other (male) child currently at the Primary school who you give consent to take part in the study (Repeats Part 1 and part 2 as shown above).